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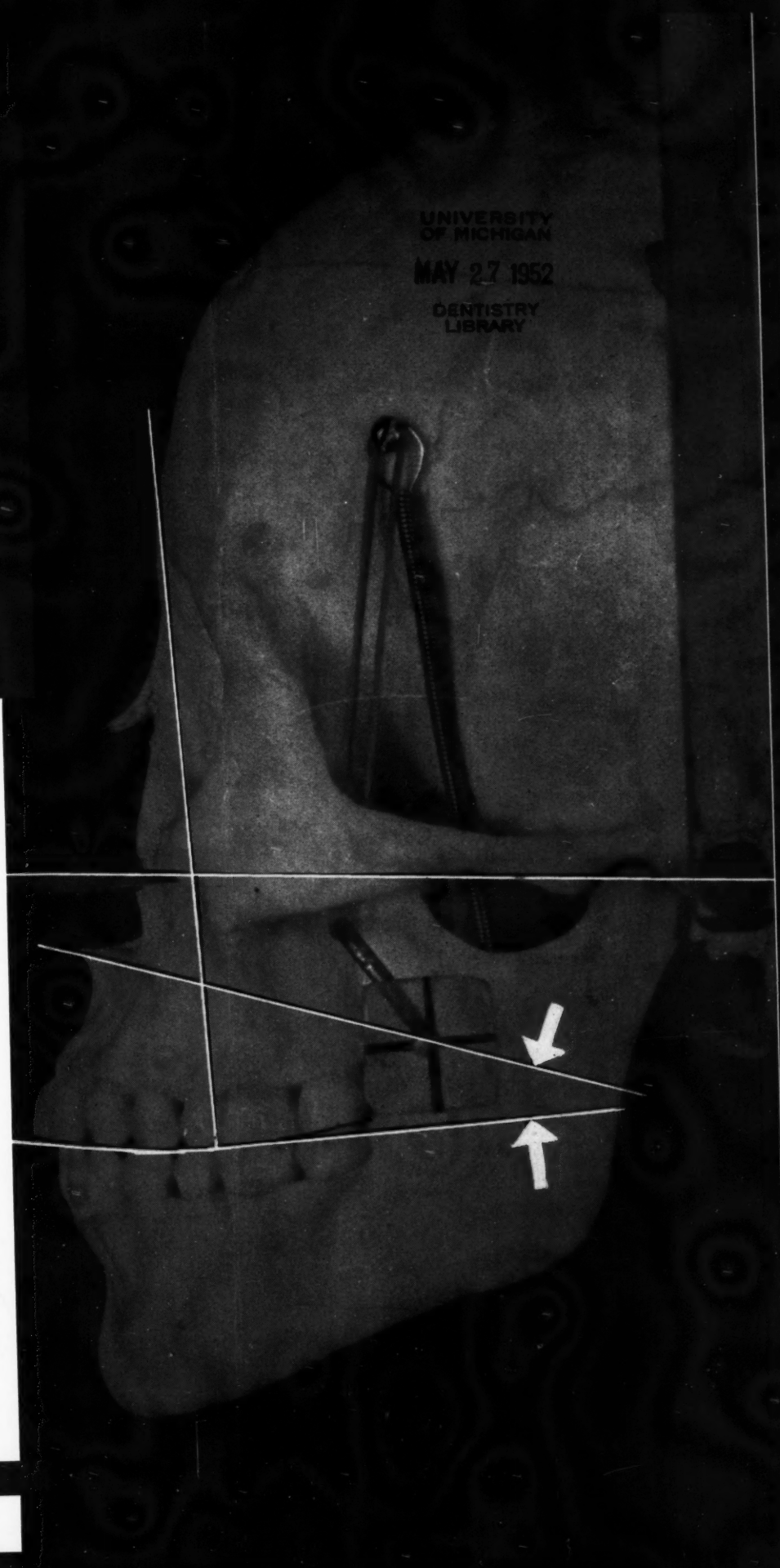

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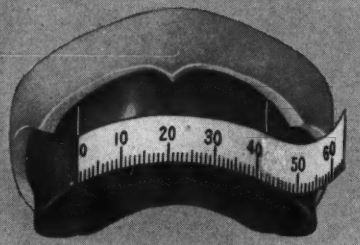
...suggested procedure for simplified tooth selection

1 ***On the wax bite rim, inscribe the position of the central axis of each cuspid.***

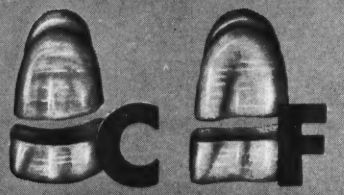
One of the popular procedures followed for these guide lines is to place a straight edge at the alae of the nose and parallel to the central axis of the nose. This line continued to bite block will in 75% to 80% of general cases correspond to the central axes of cuspids.

A. The millimeter measurement taken between the inscribed lines will correspond invariably to the numeral identification of the proper Five-Phase Anterior mold.

WIDTH OF 6s CARDED FLAT	36 MM	39 MM	40 MM	42 MM	43 MM	45 MM	46 MM	48 MM	51 MM
L LONG	L36/C	L39/C L39/F		L42/C L42/F		L45/C L45/F		L48/C L48/F	L51/C
M	M36/C	M39/C M39/F	M40/C M40/F	M42/C M42/F	M43/C M43/F	M45/C M45/F	M46/C M46/F	M48/C M48/F	M51/C
S SHORT		S39/C S39/F	S40/C S40/F	S42/C S42/F	S43/C S43/F	S45/C S45/F	S46/C S46/F	S48/C S48/F	
WIDTH OF 6s SET-UP	40.0 MM	44.0 MM	44.5 MM	47.0 MM	48.0 MM	50.0 MM	51.0 MM	54.0 MM	59.0 MM



2 **The length of the upper anteriors is the measure of distance between the edge of the wax bite rim and high lip line.**



3 **Dominant labial character (Curved or Flat) may be obtained from pre-edentulous records or if none exists, the dominant labial characteristics of near blood-relatives will serve as a guide.**

Because of the co-ordinate size system and the co-acting proximals of Five-Phase Anteriors, you can quickly select any combination of flat or curved centrals, laterals and cuspids to create personalized dentures for your patients.

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The Utilization of ANATOMIC LANDMARKS *in Creating an Occlusal Plane for Edentulous Patients*

JACK COOK, Hempstead, L.I.

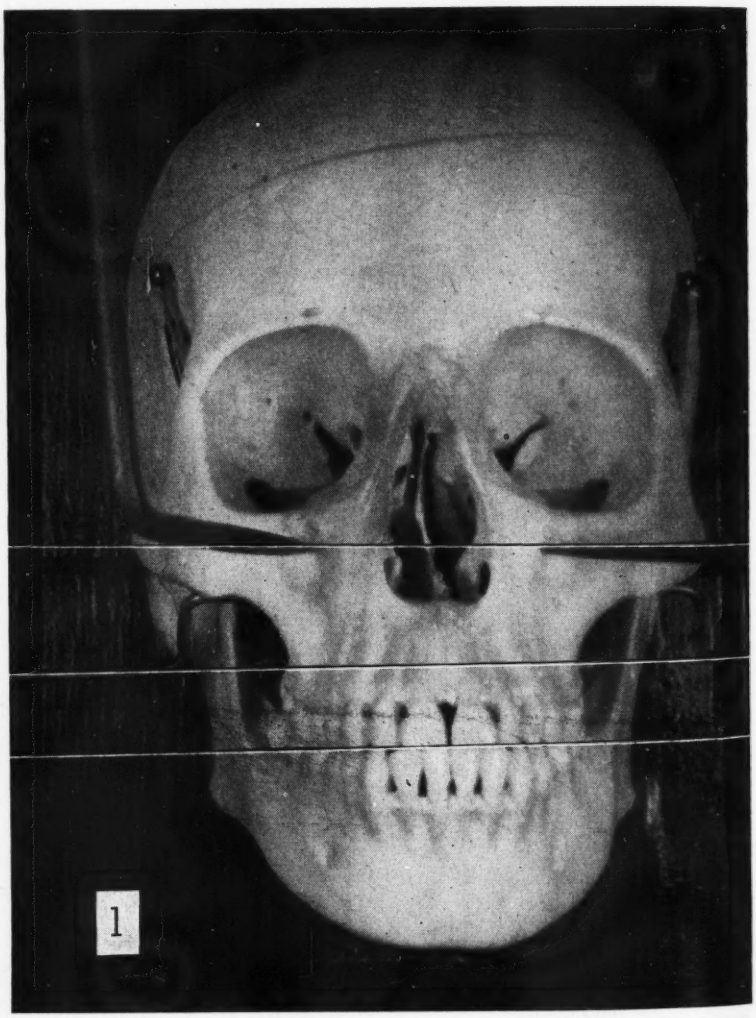
DIGEST

Many of the failures in full denture prostheses can be traced to improper location of the plane of occlusion. The underlying precepts and the means of determining the plane of occlusion, particularly in its anterior-posterior dimension, are meager and uncertain. By studying the normal dentition, predictible relationships of the plane of occlusion as it is orientated to cranial landmarks can be shown in edentulous cases. In order to plot the plane of occlusion it is required that the casts be orientated anatomically.

This paper describes an instrument which orientates the edentulous casts in a plane that is derived from predetermined anatomic landmarks. Step-by-step instructions are given for the technique used in applying the instrument and each step is illustrated.

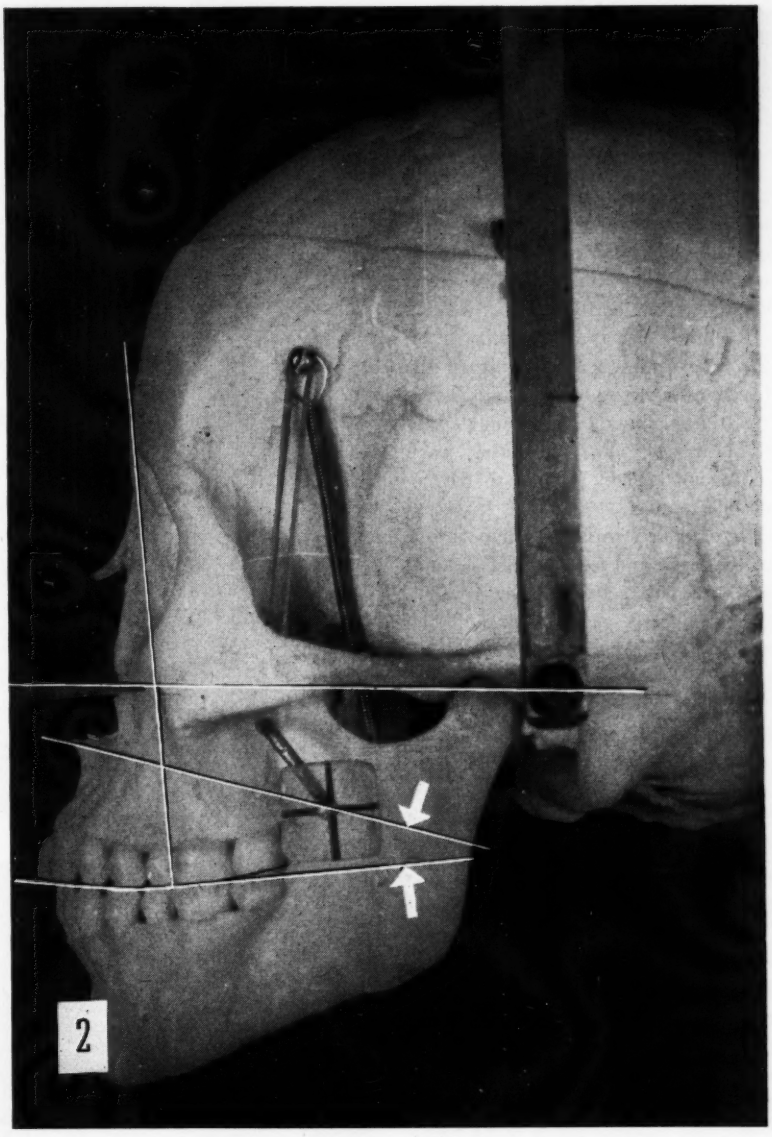
Determining the Plane of Occlusion

Once the case is orientated with the instrument designed for this purpose, the correct plane of occlusion can be determined with the same instrument. The plane of occlusion in which the casts are orientated is projected from the following anatomic landmarks: (1) right and left hamular notches, and (2) the inferior nasal spine.



1. *A needle was passed through the right and left hamular notches in twenty-seven skulls and photographed in that position. The right angle bands were made to by-pass the ramus of the mandible. The needle formed a line which was paralled within 3 degrees in its extreme case to the orbital foramina and within 1.6 degrees to the plane of occlusion. Within the limits noted the plane of occlusion is equidistant bilaterally to the hamular notches.*

2. ***The plane of occlusion in the anterior-posterior direction can be predetermined in its relationship to a line drawn between the nasal spine and the hamular notches.***



Former Method Cumbersome

Heretofore, the only method available for orientating casts anatomically was the gnathostatic system devised by Paul Simon. Simon's work in gnathostatics has made it possible to orient casts to three predetermined planes of the head:

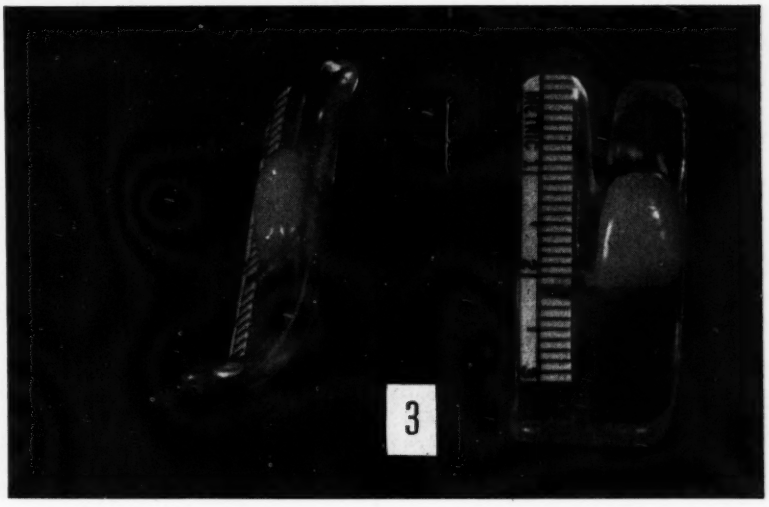
1. The Frankfort horizontal plane or the eye-ear plane.
2. The median saggital plane which, perpendicular to the eye-ear plane and passing through the raphe palatine, divides the head into two almost equal parts.
3. The orbital plane which intersects the two eye points and is perpendicular to the eye-ear plane.

The technique employed in making gnathostatic models is cumbersome, time consuming, and requires special equipment. By employing other, predetermined landmarks it is possible to orientate the maxillary casts to the skull and also to orientate the plane of occlusion properly.

Anatomic Identifications

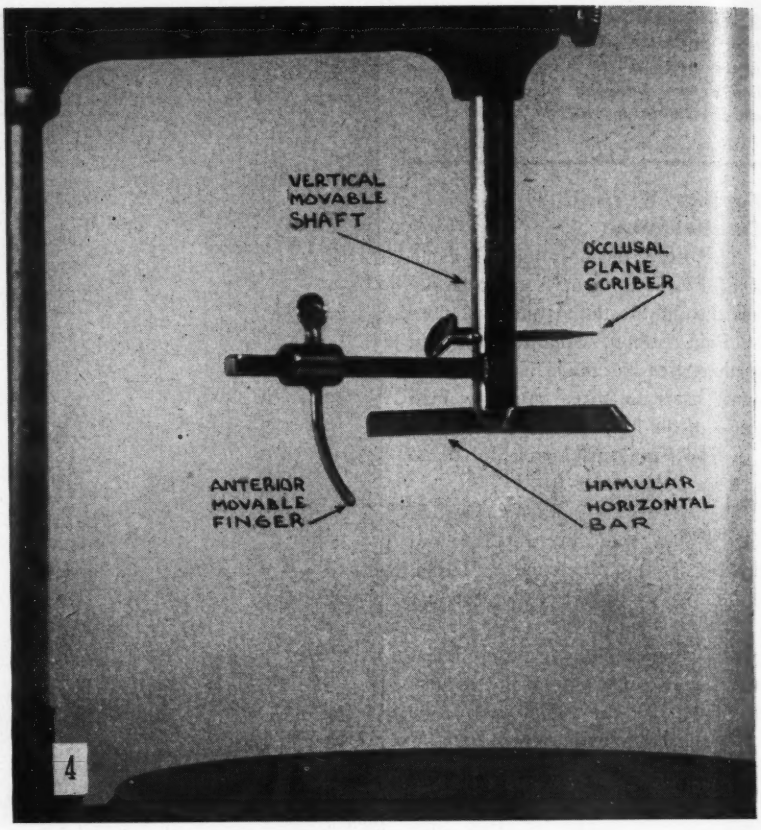
In a normal edentulous maxilla it is possible to identify the maxillary processes, rugae, papillae, hamular notches, palatine tonsil, frenum, muccobuccal fold, and inferior nasal spine.

Fixed Points—The hamular notches and the inferior nasal spine reflected in an impression of the maxilla afford guideposts from which to relate a plane of occlusion to the skull. As these points do not change their loca-



3. ***Two views of the lip calibrator. The slot in the upper section accommodates the anterior frenum and the central is prefabricated at 22 millimeters, the most commonly found position in the central incisors. The central incisors are merely an aid to visualize the plane of occlusion. The calibrator is placed under the upper lip and a measurement is secured of the lip.***

4. ***The occlusal plane projector. (A) The hamular horizontal. (B) The anterior movable finger. (C) The occlusal plane projector. (D) The vertical movable shaft.***



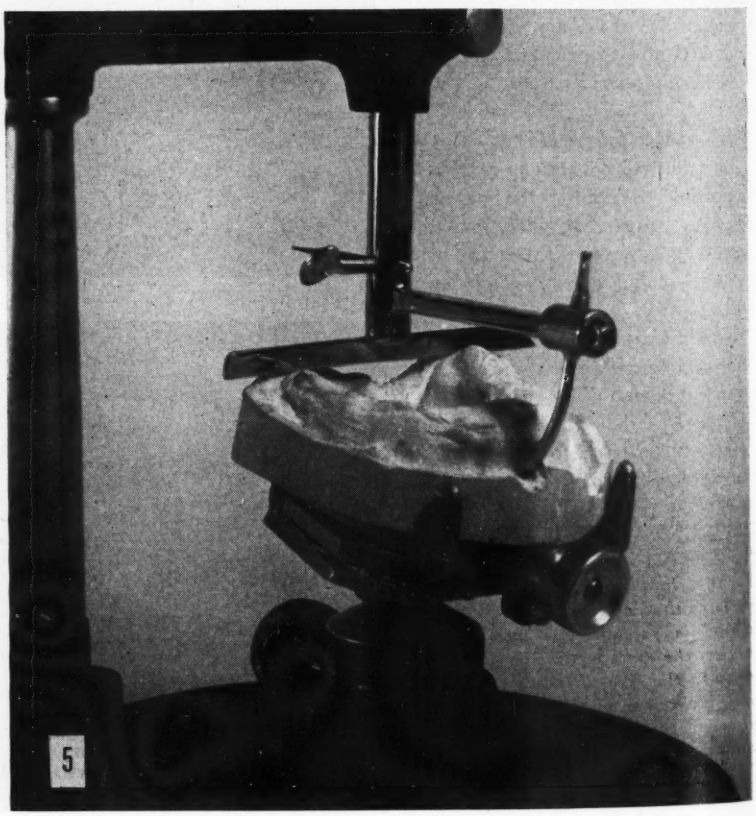
tion in the skull during the life span of the person, they are fixed in their cranial relationships regardless of what happens to the alveolar processes and to the dentition. Usually, alveolectomies, either anteriorally or on the tuberosities, will not disturb the location of these points. For this reason these points can be equated in the vertical plane regarding each other and also in relation to the occlusal plane.

Imaginary Parallels—The positions of the right and left hamular notches are such that a long needle piercing the skull and passing through the right and left hamular notch would be in a line parallel to the orbital foramina. It would also be parallel to the line drawn through the plane of occlusion (Fig. 1).

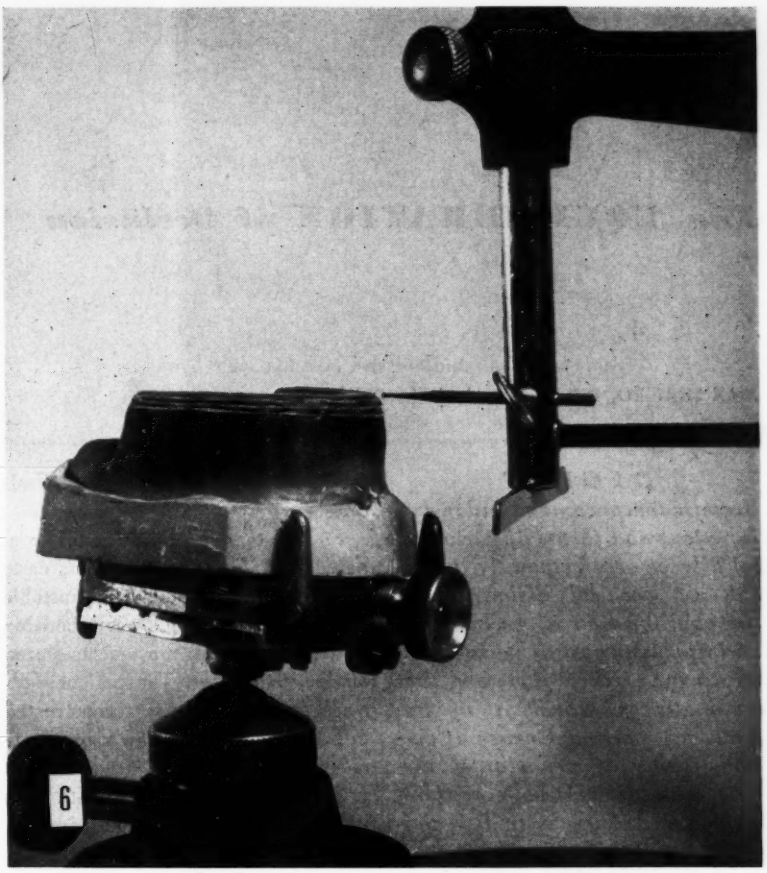
Measurements Vary—The vertical distance between the hamular notches and the plane of occlusion varied between 4 and 12 millimeters in one hundred cases studied.

The inferior nasal spine is in most cases between 19 and 24 millimeters from the incisal edges of the anterior teeth. It has been noted that where the anterior measurement is in the upper figures, such as 23 or 24 millimeters, the measurement on the posterior end likewise tends to be high; 10, 11, or 12 millimeters.

Schematic Relationship—There is a definite schematic relationship in these measurements between anterior and posterior. The variation in patients of the relationship of the occlu-



5. ***The horizontal hamular bar is placed astride the two hamular notches and the movable finger is brought to bear against the muccobuccal fold in the vestibule adjacent to the frenum. While the model is in this position the base of the model holder, being attached with a universal joint, accommodates itself to the table and is then securely locked. The model is then ready for the plotting of the occlusal plane.***



***6.** The scriber records on the wax-bite a line which is the anatomic occlusal plane projected from the two hamular notches and the muccobuccal fold adjacent to the frenum.*

sal plane to the three points mentioned is constant in its angulation (Fig. 2), although it varies in location within the interdental spaces.

Procuring Impression of Maxilla

In order to orientate a cast correctly, an accurate impression of the maxilla is required. This impression must include the hamular notches and the muccobuccal fold adjacent to the labial frenum.

Method—To obtain the impression the following steps should be taken:

1. The nasal spine is palpated in the muccobuccal fold and marked with an indelible pencil.

2. If the impression includes the indelible register it is evident that the impression has been carried to the nasal spine.

3. Having secured an accurate impression containing the hamular notches and the inferior nasal spine, the model is situated according to the relationships produced by the planes.

Instrument Utilized—Through the use of the Cook occlusal plane projector the two planes described are located in such a manner that they can be indicated on casts of the edentulous mouth. In this way it is possible to correlate the patient's plane of occlusion to the cranial anatomy.

Technique

The technique of projecting an anatomic plane of occlusion requires that the location of the plane of occlusion be known prior to the construction of the bite-rim.

2. Since the plane of occlusion is, for esthetic considerations, positioned at or about the upper lip line, it is necessary to measure the distance from this point to the muccobuccal fold directly below the nasal spine. For this purpose a measuring device has been designed, a lip calibrator (Fig. 3).

3. After the impression of the maxilla is secured and a cast is made, clearly showing the anatomic landmarks discussed, the cast is clamped to the model clamp and placed in position on the working table by the occlusal plane projector (Fig. 4).

4. Having orientated the cast in this manner (Fig. 5) the plane of occlusion may be plotted. The scriber (Fig. 4) is placed at a distance from the muccobuccal fold, determined from the measurement secured from the patient with the calibrator.

5. A bite-block is built to the level of the scriber at this position (Fig. 6). Inasmuch as the bite-block may require some correction at the chair in raising or lowering the plane, the last 3 millimeters are made in *laminated wax* to enable the operator to raise the plane without disturbing the anatomic orientation embodied in it. This is done simply by peeling off a layer of wax as needed.

Establishment of Centric

The dentist may employ the method of choice to achieve centric. However, as the upper bite-block embodies an anatomic occlusal plane it must remain unsoftened in the process of securing centric.

Advantages of Anatomically Orientated Casts

1. The plane of occlusion is predetermined in the bite-rim so that less chair time is necessary.

2. Inconsistencies in ridge height are minimized because the new plane bears no relationship to the ridge height but is predicated on stable anatomic landmarks.

3. Better function is obtained in dentures in which the teeth are arranged so that they are harmonious with cranial anatomy and cranial architecture than in dentures in which teeth are arranged haphazardly.

4. The esthetic effect of teeth arranged in harmony with cranial anatomy is more desirable than teeth arranged on the basis of the ala-tragus plane.

278 *Fulton Avenue.*

The EQUILIBRATION *of Occlusion*

MAX SHAPIRO, D.D.S., Beverly Hills, California

DIGEST

Because temporomandibular dysfunctions and forms of periodontal disease are frequently the result of occlusal disharmonies, the equilibration of occlusion is an important part of periodontal treatment. Miller[1] believes that traumatic relationships of the teeth are a primary cause of certain forms of periodontal disease, while Orban[2] believes them to be a secondary cause. It is generally agreed, however, that traumatic relationships should be treated.

This article presents the specific methods used by the author for eliminating occlusal disharmonies. Each step in the procedure outlined is illustrated.

Effects of Directional Forces

Unequal distribution of forces in a direction which the periodontal structures can not tolerate, and other abnormal pressures, such as those which result from habits, should be eliminated for successful treatment in periodontal disease. Forces should be placed upon the long axis of the tooth, the direction in which they are best tolerated (Fig. 1).

Methods for Eliminating Occlusal Disharmonies

Several methods have been proposed to eliminate traumatic relationships in the human dentition. These may fall into two general classes:

First Method—All the teeth are prepared for inlays or crowns, and casts mounted on a completely adjustable articulator with the exact recording of the patient's jaw movements placed on the articulator. The patient's occlusal surfaces are then reconstructed in harmony with the jaw movements recorded.[3,5]

Second Method—The teeth are ground directly in the mouth in such a manner that the occlusal surfaces harmonize with the jaw movements. Occasionally, it may also be necessary to reconstruct part of the mouth. To accomplish this technique several methods have been described.[1,6,7]

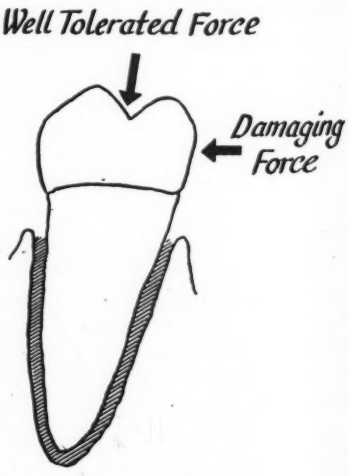
Procedure—Occlusion in the mouth may be balanced in the following way: (1) Construct upper and lower study casts, using alginate or hydrocoloid impression material for the purpose of recording and studying (a) the width of the occlusal table, (b) the crown root ratio, (c) facets, (d) potential food impaction areas, (e) occlusal anatomy, and (f) marginal ridge relationships. (2) Determine correct centric.

Definitions

Physiologic or True Centric—The most retruded position of the mandible from which all movements emanate and from which the patient can function without strain, is described as true centric.

Convenience or Acquired Centric—That relationship between the closed upper and lower jaws, with the maximum number of areas in contact is termed convenience or acquired centric. This position may be forward of true centric or it may be behind true centric, although the latter condition is rare. Ideally, it should be the same as physiologic or true centric (Fig. 2).

Method of Determination: (1) With the patient in a relaxed state, and seated in a vertical position, he is told to place the tip of the tongue at the junction of the hard and soft palate. (2) With the lower jaw relaxed, the jaw is gently opened and closed to its most retruded position. Prematurities in centric are easily observed at this time.



1

[1]Miller, Samuel Charles: Textbook of Periodontia, ed. 3, Philadelphia, Blakiston, 1950.

[2]Orban, Balint: Periodontal Lectures, 1951.

[3]McCollum, B. B.: Fundamentals Involved in Prescribing Restorative Remedies, D. Items Interest **61**:522-535, 641-648, 724-736, 852-863, 942-950 (June-Dec.) 1939.

[5]Kiesler, Max: Complete Occlusal Reconstruction in Mouth Rehabilitation, New York State Dent. J. **14**:7-17 (Jan.) 1948.

[6]Schuyler, Clyde H.: Fundamental Principles in Correction of Occlusal Disharmony, Natural and Artificial (Grinding), J.A.D.A. **22**:1193 (July) 1935.

[7]———: Correction of Occlusal Disharmony of the Natural Dentition, New York J. Dent **13**:445-462 (Oct.) 1947.

Experience Required: Determination of true centric is a difficult procedure and requires extensive experience for ease of accomplishment. Other techniques for this procedure have been described.[3,4]

Determination of Prematurities and Chewing Pathways

The patient should be observed in right lateral, left lateral, and protrusive positions at a point where lower occlusal and incisal contact areas on the working side are in approximately the same vertical plane as corresponding points on the upper teeth (Fig. 4). Prematurities in these conditions should be noted.

The extent of lateral excursions, the points of initial contact, and the movements of teeth in chewing can be determined by having the patient chew peanuts. At this time observe blanching of gingival tissues and mobility of the teeth, as well as the chewing habits of the patient.

Steps in the Equilibration of Occlusion

The following steps are a guide to a complete equilibration. All of the following steps, however, may not always be necessary. Some cases will need only the last procedure. Other cases will be completed after the first step.

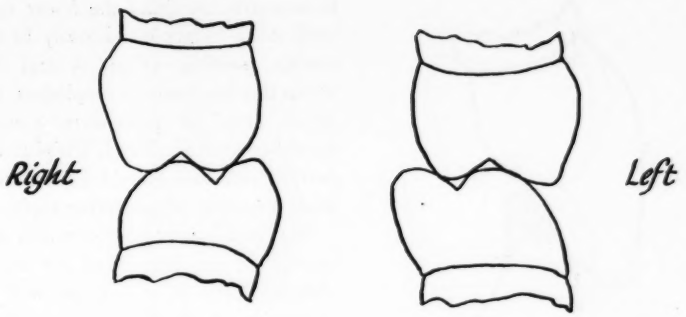
1. Specific grinding and shaping procedures should be carried out as the first step in equilibration.

Purpose of Initial Grinding—(1) Elimination of excessive stress due to broad occlusal tables, if present, and if sufficient bone is lost to warrant the procedure. (2) The buccolingual width of the posterior teeth should be narrowed by rounding the buccal and lingual surfaces as shown in Figure 3. This increases the overjet of the posterior teeth and may decrease vertical stresses by almost one-half. (3) Facets on areas of the teeth which should be convex are eliminated at this time. One point of the facet, however, should not be ground so

Narrowing of true centric.

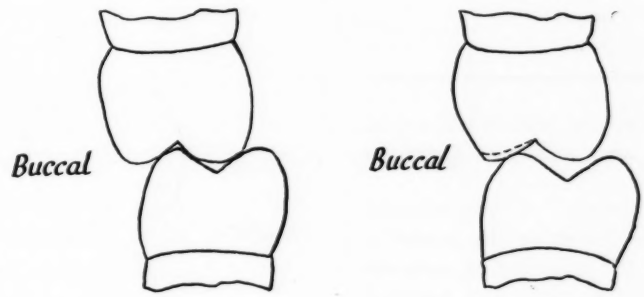
3

[4]Niswonger, M.D.: The Rest Position of the Mandible and Centric Relationship, J.A.D.A. 21:1572 (Sept.) 1934.



Normal bucco-lingual relationships in true centric.

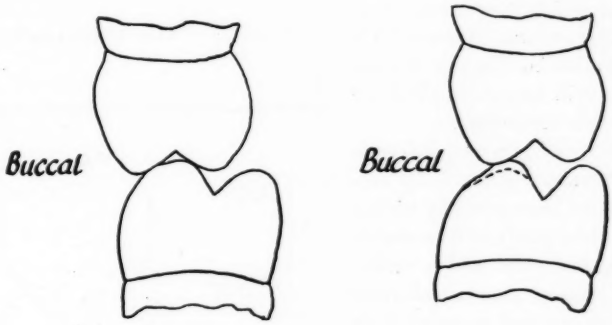
2



Centric normal

Lateral prematurity (working side)
(Grind buccal of upper)

4



Centric prematurity

Lateral prematurity
(Grind buccal of lower)

5

Shaded area may be ground

6

that true centric relation will not be changed, and the vertical dimension decreased.

2. Narrowing of buccolingual width and increasing the overjet is followed by balancing of marginal ridges so that contiguous marginal ridges on adjacent teeth are of equal height. This procedure is carried out to reduce food impaction.

3. Modification of plunger cusps in food impaction areas is accomplished by rounding and grinding off the tips of the cusps which may impact food into the interproximal spaces. This step, in addition to shaping of marginal ridges, will frequently eliminate food impaction completely.

Elimination of Prematurities in Centric—Premature contacts in centric relation are discovered by having the patient close gently in true centric and noting the teeth which strike. Wax, thin carbon paper, and typewriter ribbon are used to detect these prematurities.

Rules for Grinding—Several rules apply when grinding premature contacts in centric:

(A) Before grinding, always consider the *eccentric* relationships of the tooth to be ground.

(B) Usually, the concave areas of upper posterior teeth are ground to relieve centric prematurities. It is important, however, when a lower cusp hits heavily in centric and also heavily in eccentric, to grind the *lower* cusp until it no longer hits heavily in the centric position (Figs. 4 and 5). When this has been accomplished, the upper area of premature contact should be ground. This is a highly important rule and should be followed when grinding all posterior teeth.

(C) If a lower anterior tooth hits heavily on the lingual of the upper anterior teeth in centric as well as protrusive, it is advisable to grind the lower until it strikes correctly in centric; then grind the upper until protrusive relationship is corrected. If the lower tooth strikes heavily only in centric, and not in eccentric, the upper tooth should be ground.

After correction of centric, mark centric with red typewriter ribbon and do not touch the red areas in future grinding.

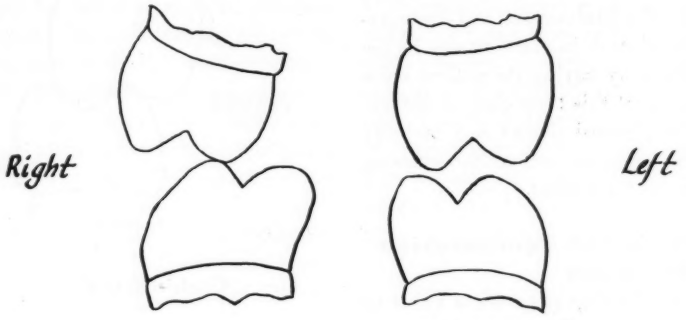
Protrusive Grinding—Prematurities in protrusive relationships are removed in a similar manner:

1. The teeth should be ground in protrusive so that as many teeth as possible carry the load.

2. Teeth are marked with thin blue or black carbon paper or typewriter ribbon.

3. The prematurities found are usually removed from the upper teeth.

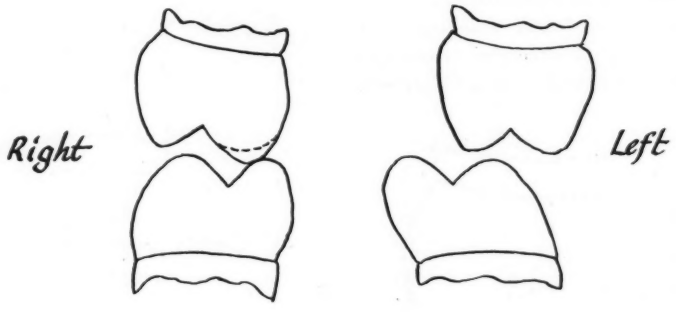
4. Occasionally it is permissible to grind the lower anterior teeth when prematurities in protrusion are noted



"Balancing side" "Working side"

Prematurity or interference on balancing side

7



"Working side" "Balancing side"

Same cases as in Fig. 7 showing premature contact on working side (Also prematurity in centric)
Dotted lines on lingual cusp of upper right molar illustrate area to be ground

8

even though the anterior teeth strike normally in centric. This is done (A) when there is contact in lateral excursions between the upper and lower anterior teeth and none normally in centric; or (B) where there is a large area of centric contact as in deep overbite cases (Fig. 6).

5. Usually, grinding of the lower anterior teeth will result in taking these teeth out of centric relationship contacts. They subsequently erupt with recurrence of premature contact; therefore, grinding of the lower is usually to be avoided except as previously described.

Right and Left Lateral Excursive Positions

The right and left lateral positions are also ground so that prematurities in these positions are removed from the upper teeth. It is important, however, to note that occasionally a prematurity will be observed on the balancing side. In this situation no set rules can be followed. The case must be studied carefully to produce a better result after occlusion has been equilibrated than existed before:

1. The study models should be carefully observed and the teeth ground to the position desired (Figs. 7, 8, 9, 10, and 11).

2. In correcting prematurities on the balancing side, some previously marked red areas may have to be ground. However, one point of centric contact at least should remain after grinding.

3. Diagrams of the existing condition and the condition to be attained after grinding are helpful in determining which part of a tooth is to be ground.

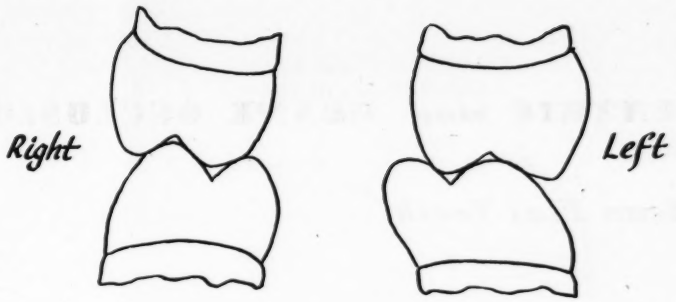
General Considerations

Because of the natural mesial drift of teeth, there will be a slight change in occlusal relationships throughout life. The patient should be observed regularly as occasionally small amounts of grinding may be necessary.

It may also be necessary to build up certain teeth by means of restorations and to grind elongated teeth to bring them into a proper occlusal plane before restorations on the opposing arch are constructed.

The basic rules set forth here should be followed closely. With a few variations to fit specific cases they will result in a harmonious occlusal relationship.

Fox Wilshire Theatre Building.



Same case (Fig. 7) showing corrected relationships in true centric (Case in other movements are corrected)

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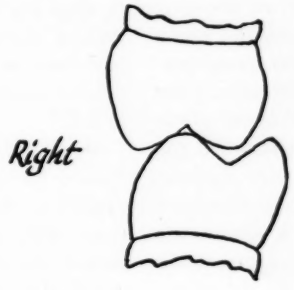

Centric appearance if lower lingual prematurity were removed (Doesn't correct right lateral prematurity)

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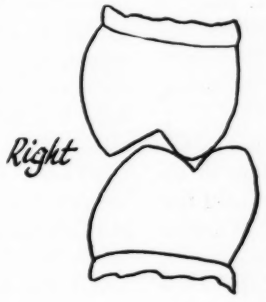


Same case if lower only were ground (More tooth substance ground, flat occlusal table)

11

CENTRIC *and* PLANE OCCLUSION

Mean Flat Teeth

HARRY L. PAGE, Valparaiso, Indiana

DIGEST

This article is based on the premise that flat teeth are the product of two erroneous concepts: centric and plane occlusion. That the use of flat teeth is an error that attempts to compensate for these misconceptions is demonstrated. The article also discusses the importance of a kinematic rather than a static relationship in articulation.

Crown Formations of Nature

In carving the first modern artificial teeth the designers used as models the magnificent crown formations of nature. The possibility of an occlusal pattern based on a million years of success in nature creating distress was not remotely anticipated. Unaccountably, however, a number of serious problems developed.

Reduction of Normal Cuspation—In efforts to find a solution to the problems that arose it was noted that a modification or reduction of normal cuspation brought a lessening in "cuspal interference" and an increase in patient comfort.

Introduction of Cusp Perversion and Flat Teeth—The observations made seemed to support a theory that there was a difference between occlusal surfaces suitable for natural teeth with their solid anchorage and artificial teeth with bases which were sometimes migratory.

Value of Pain

The trend to abortive cusps or none at all was stimulated by pain which is often regarded as a disease rather than a symptom. That relief from pain may be as dangerous as a continuous anesthetic is frequently overlooked.

Modification of Cusps Increases Patient Comfort—With orthodox articulation flattening or modifying cusps will, unquestionably, increase patient comfort. However, cusp removal also decreases tooth efficiency and power and leaves a commonly observed unfortunate sequela: a painfully *acute* malady is changed into a comfortably *chronic* condition wherein oral tissues are more gradually but just as surely destroyed.

Warning of the Need for Correction—Pain, like fever, should be regarded as an alert and benign messenger, a warning that some condition needs correction and should induce a search for clinical mistakes rather than a criticism of nature's handiwork. The operator should remember that while nature rarely errs, man commits innumerable blunders. In the search for human errors it is found that centric, although highly respected, has spurious aspects.

Articulation a Kinematic Relationship

The most ingenuous registrations and checks taken in the head are without value until they have been transferred to an articulator where the actual setting and meshing of the teeth are done. These registrations include centric. Centric is a worthless registration because it is a fixed position; a static relationship. Articulation is not static but a moving or kinematic relationship. To set up teeth requires opening and closing the instrument. This opening and closing is kinematics.

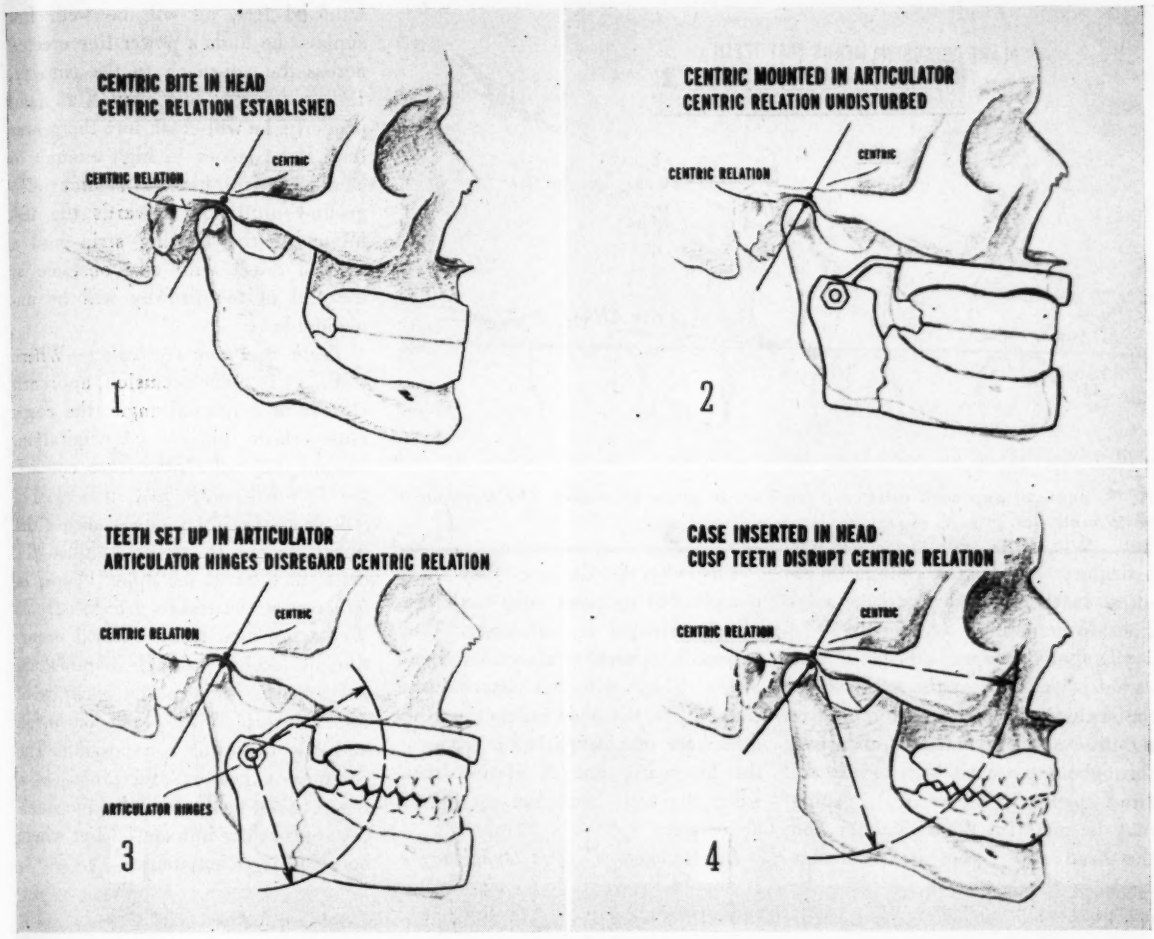
Static Relationship Lost in Transference—When centric is transferred to any instrument its static relationship is lost. The articulator joints, representatives of the temporomandibular joints, assume a new and entirely different relationship to the occlusal surfaces. The rotational centers of these articulator joints, not centric, now govern the kinematics that in turn dictate how the teeth shall be apposed.

Centers of Relation Different—As though to increase the futility of centric, movements in any standard articulator are different from those in the jaw because the respective centers of rotation are different. Nor will a "gothic arch tracing" avoid any of these situations.

Limitations of Gothic Arch Tracings

(1) Single, or simultaneously taken multiple tracings, (2) intra-oral, extra-oral, or a combination or both, or (3) the common pin and plate scribing or the multiple pin and compound chew-in can do no more than indicate that both condyles were in coincidental terminal relationship at some point in the scribing.

Centric Not Disclosed—Even while the tracings are still attached to the jaws their apexes do not disclose centric. From the apex of a gothic arch tracing it is impossible (1) to make a sighting, (2) run a line to, or (3) know in what direction centric



1. *Simple surfaces adjust readily to centric and centric relation in the head.*

2. *Simple surfaces adjust with equal readiness to any articulator.*

3. *Articulator hinges ignore centric and centric relation. The hinges dictate how teeth shall be set.*

4. *Teeth set to the articulator hinges ignore centric and centric relation. Cusps must be removed to relieve interference.*

may be. Out of the head the apexes relate to nothing except occlusal apposition in one plane only, the horizontal, and at only one vertical opening.

Registration Must be Transferred—Meanwhile it must not be forgotten that the head registrations have no value until they are transferred to an articulator. *A single plane recording has no transfer value where motion in three planes is required.*

Tracings Ineffectual—That these tracings are worthless should be apparent from the fact (1) that the occlusals may be transferred readily to any unadjusted or *unadjustable articulator*, (2) that they may be mounted in such an instrument backwards, sidewards, upside down, or standing upright and the tracings will make no protest, and (3) that the case will be ruined should the technician open the bite in any articulator from the crudest to the most precise.

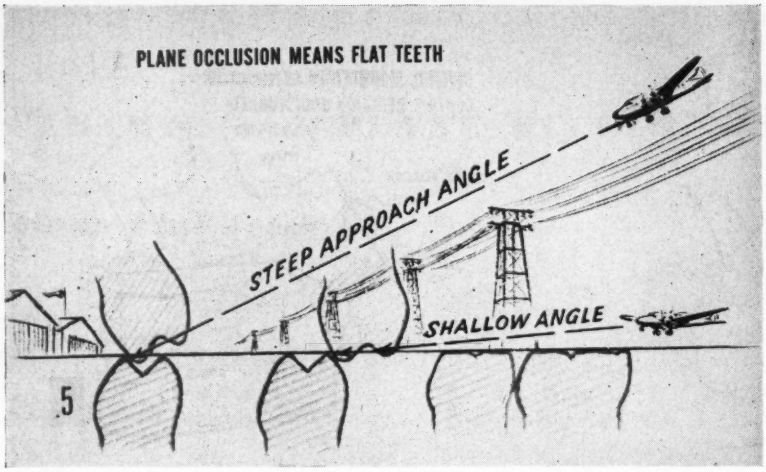
Futility of the Face-bow—Nothing is gained by combining a face-bow with a gothic arch tracing. However, a face-bow is an *attempt* at sound procedure. It is intended to locate the condyles and to relate them to the occlusals so that the orientation can be transferred to an articulator. The use of a face-bow is an admission that the determination and transfer of the condylar-occlusal relationship is necessary.

Readings Inaccurate—Since the position of the face-bow is located by guesswork its use ends in an inaccurate relationship and transfer while it creates an illusion of accuracy.

Accuracy of the Hinge-Bow

The rotational or axle center, known as the hinge-axis, of each condyle is pin pointed independently by the hinge-bow. A hinge-bow also orients the occlusals to the patient's hinge-axes by a hinge bite. For this reason there is no need for gothic arch tracings. The terminal relationships of the occlusals to the hinge-axes in the head become fixed in all planes.

Transference of Terminal Relationships—Of equal importance is the fact that these terminal relationships can be transferred intact to any suitable articulator. Should the articulator be unsuitable, that fact is apparent immediately. Terminal relations in the transverse-vertical and horizontal planes are locked in the



5. ***No angle of approach suits cusp teeth set in plane occlusion. The teeth must be ground flat.***

articulator and cannot change thereafter. In the sagittal plane the relationship is mobile.

Changes Accepted—Because the radial orientation of the occlusals in the sagittal plane is the same both in the head and instrument at all points throughout the entire circle, any desired change in the vertical opening may be made in the articulator and the head will accept it. A change made in the head will, likewise, be accepted by the articulator.

The Effects of Centric and Plane Occlusion on Tooth Surfaces

Given a contact relationship, simple surfaces can be separated from, or returned to, that contact along any angle or path and from any direction. For this reason related bite-blocks can be removed from the mouth and can be mounted in any barn door hinge type of articulator. They will still open and close perfectly even though the arc of closure is completely different from the arc of closure in the mouth.

Reason for Use of Flat Teeth—Under the elemental conditions described, centric, with its one-dimensional, static limitations, will suffice. This is the principle reason why so many techniques advocate some form of flat teeth. Centric forces a duplication of the simple bite-block type surfaces used in taking the centric bite because nothing else will work.

Cusp Teeth—Because they have complicated surfaces, cusp teeth cannot be treated so carelessly. They cannot be opened or closed from any angle. They will not interdigitate smoothly in the head unless the kinematic arc of closure is the same as the kinematic arc of closure used when the teeth were set up in the articulator.

Interference—Centric Deficiency—It should be clear that cusps, transverse ridges, and sulci that have been arranged to mesh in an articulator where the approach is along a shallow arc will refuse to mesh when the approach in the head is along a deep arc and vice versa. This is commonly called cuspal interference. Actually it is centric deficiency for *it is impossible to operate three dimensional kinematics from a one-dimensional, static terminal relationship.*

Why Plane Occlusion Requires Flat Teeth—Once the significance of identical approach paths in the head and articulator is realized, there should be no difficulty in appreciating why plane occlusion, too, requires flat teeth. When set in plane occlusion, lower cusps cannot clear opposing upper cuspal pinnacles as the teeth close unless the approach is at an unnaturally steep angle.

Illustration—Imagine a plane attempting to land on a runway barely long enough. If the pilot can bring his ship in on a horizontal approach so as to touch the runway in the first hundred feet, all will be well. But suppose he finds a power line erected across the approach to the runway. If he comes in low enough to land properly, he will crash into the power line. If he comes in high enough to clear the wires, his ship cannot touch ground until well towards the terminus of the landing strip and a ground crash with any obstacle at the end of the runway will be unavoidable.

Teeth in Plane Occlusion—Where teeth, set in plane occlusion, approach closure at a normal angle, the cusps must clash before interdigitation. Should they miss premature contact, the forward component in occlusion will send the lower cusps across the upper fossae to strike against the distal inclines of the upper cusps. In either case, the results are disastrous. Well-articulated teeth, natural or artificial, occlude distal inclines of lower cusps with mesial inclines of upper cusps. With plane occlusion and cusp teeth this is impossible. The common expedient, therefore, is a resort to flat teeth where the mechanical approach is immaterial but where necrobiosis is inevitable.

Conclusions

Nature put cusps on teeth for a purpose and nature's design should be emulated rather than questioned; this familiar argument in favor of cusp teeth has lost no force with time, repetition, or debate. The use of inefficient, traumatizing, flat or unnatural teeth represents, not clinical progress, but clinical stagnation.

(1) Centric and the centric bite should be displaced by the hinge-axes and the hinge bite, (2) plane occlusion should be displaced by a natural occlusal curve, and (3) the unnatural laterals now being used should be supplanted by natural vertical movements that incorporate the medial jaw movements as satellites. When these changes are made natural cusp teeth will no longer impose their present difficulties. The patient will possess an efficient, comfortable, nontraumatic chewing mechanism.

104 *Garfield Avenue.*

CAST GOLD CROWNS

As Retainers for Clasp Partial Dentures

DANIEL ISAACSON, D.D.S., Trenton, N.J.

DIGEST

This article presents step-by-step directions for the construction of cast gold crowns which can be used as retainers for clasp partial dentures.

Advantages

The use of a cast gold crown as a retainer in fixed bridgework and precision attachments has been highly successful in many situations:

Esthetics—The use of the acrylic-faced cast gold crown has been perfected so that the crown can serve adequately where esthetics are a cardinal factor.[1]

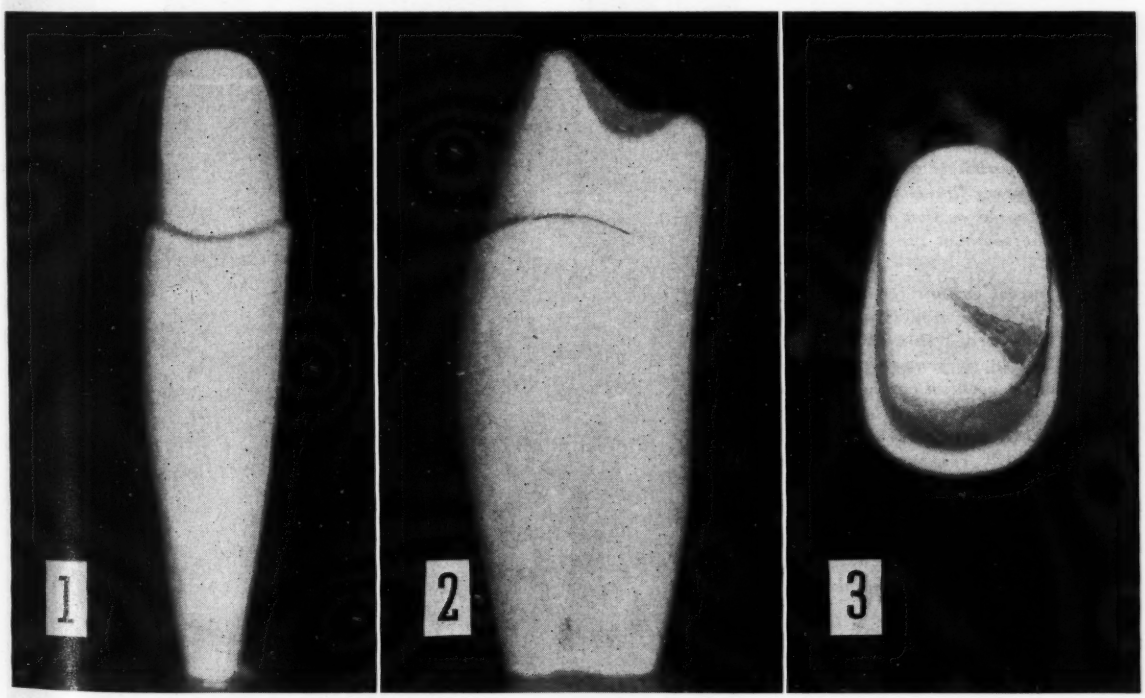
Substitutes for Fixed Bridges—Dentists are often required to construct an appliance in a mouth where a fixed bridge is not indicated and where the patient cannot undergo the expense of a precision attachment. A conventional partial in some of these cases is doomed to failure due to specific unsatisfactory conditions in that particular mouth.

Preparation of the Mouth Often Incomplete—Steffel[2] states that "developments in partial denture prosthesis seem to suffer in comparison to developments in complete denture prosthesis," and that "the step in clasp partial denture procedure most often neglected or omitted altogether is the preparation of the mouth or alterations before making impressions.

AUTHOR'S NOTE: Gratitude is expressed to the Philadelphia Study Group which has met regularly for many years for discussion of the vital problems of restorative dentistry; and to Daniel Seigle, D.D.S., and Irving L. Yalisove, D.D.S., for advice and assistance.

[1]Cohn, Louis Alexander: The Acrylic-faced Cast Gold Crown, J. Pros. Dent. **1**:112-134 (Jan.-Mar.) 1951.

[2]Steffel, Victor L.: Fundamental Principles Involved in Partial Denture Design, J.A.D.A. **42**:534-544 (May) 1951.



1, 2, and 3. ***The preparation differs from the typical preparation in that there is a deeper cut on the occlusal aspect to allow sufficient room for the occlusal rest. The shoulder will permit a greater bulk of acrylic and enhance the esthetics of the crown.***

Use of Retainers—When indicated, the abutment teeth can be prepared and cast gold crowns placed which will serve as retainers for the partial denture. The result is a partial which has some of the advantages of a precision attachment; with proper splinting of some teeth it will give many of the benefits of a fixed bridge.

Indications for Use as Retainers

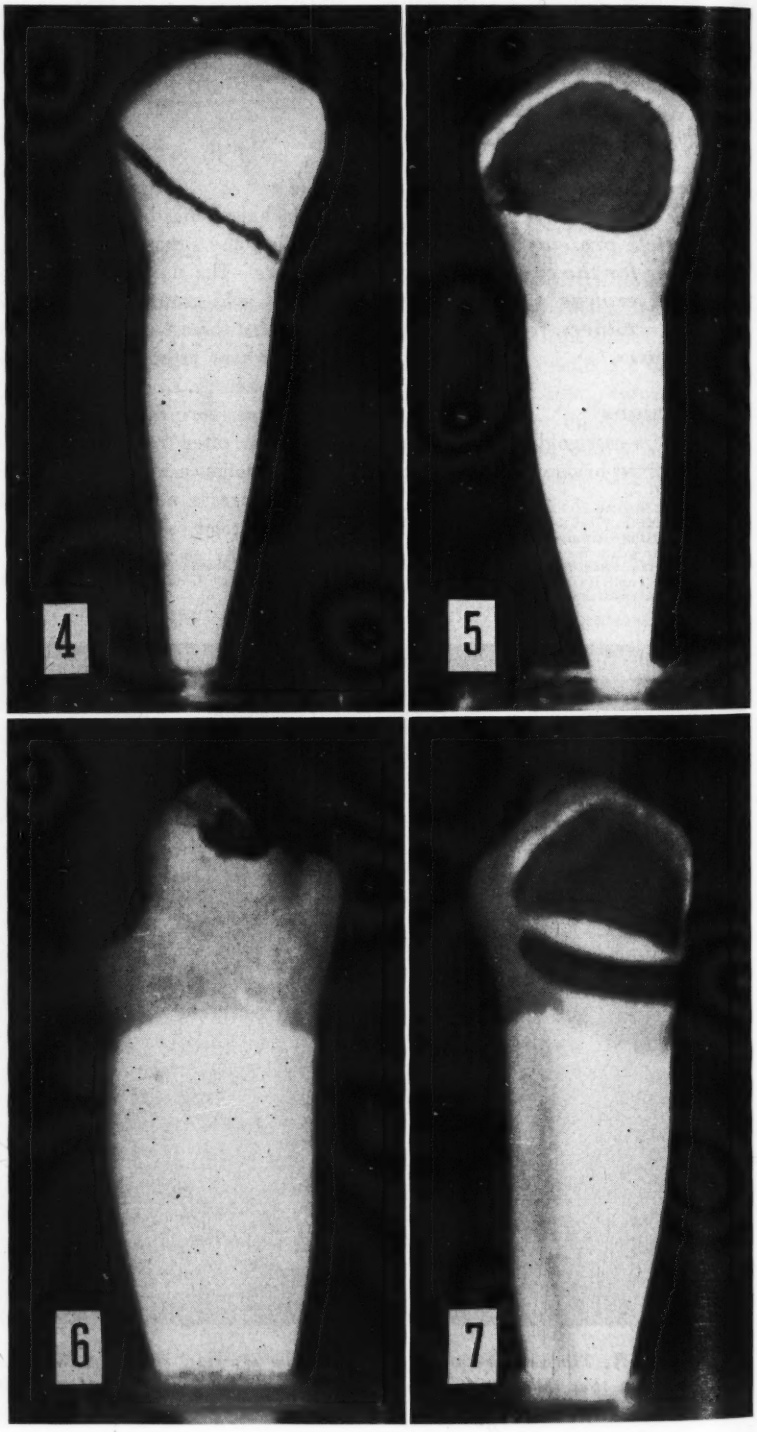
Cast gold crowns are indicated for use as retainers for partials in the following cases:

1. On teeth that are badly broken down due to the ravages of caries and especially in a mouth highly susceptible to caries.
2. On teeth that are malposed or because of their shape cannot serve as satisfactory abutments.
3. On periodontally involved teeth which require splinting to stronger members of the dental arch.
4. In an arch in which the occlusion has been altered as a result of tilted, rotated, or overerupted teeth.
5. On teeth that are worn by attrition or malformed because of erosion.
6. In mouths where gingival recession is occurring and the normal gingival contour of the crown has been lost.

Preparation of the Teeth

Because it must be altered to allow for deep recesses in the retainer (Figs. 1, 2, and 3) the preparation is not the typical full crown preparation. The following steps are included in the preparation:

1. A gold casting will be used as the retainer. A full shoulder, therefore, is not necessary. For esthetic reasons, the preparation should have a labial or a buccal shoulder in those teeth that will require an acrylic window. Lower teeth may be shoulderless.

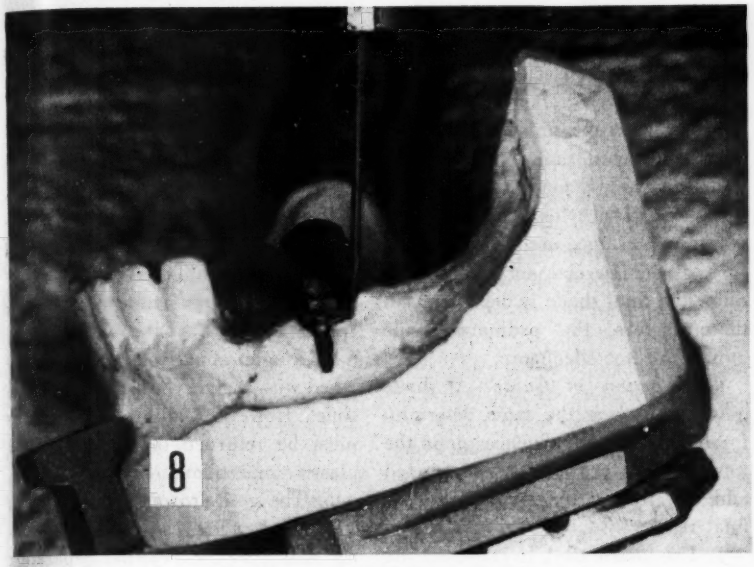


4. *The clasp that is desired is visualized. The survey line is drawn and the crown contoured so that the clasp will encircle the tooth at the desired area.*

5. *The buccal cut-out for the acrylic veneer. The tooth used is a lower bicuspid; therefore a thin line of gold will be visible to protect the veneer and to ensure occlusal contact on gold. Enough room has been left on the gingival third of the crown so that the clasp arm will rest on gold rather than on acrylic.*

6. *The occlusal rest recess is prepared in the crown. The rest must be deep enough so that it will not break under stress.*

7. *The crown showing the clasp arm in position. To increase retention, the crown may be contoured with an additional bulge above the clasp but it must be at the most flexible part of the clasp.*



8. *Wax patterns being surveyed.*

2. The occlusal surface is cut deeply on the side which will contain the recess for the rest.

3. The preparation is carried gingivally to areas relatively more caries resistant because rampant caries is one of the reasons for this type of restoration. The preparation should end at the base of the gingival sulcus. Glickman[3] is of the opinion that the preparation should end at this point to prevent unnecessary recession of the gingiva.

4. Correct malpositions by altering the preparation to the individual requirements.

Technique

1. Copper band impressions are taken of the individual preparations, using a low fusing compound. The impression should extend to the base of the gingival sulcus. This will serve a dual purpose (1) protection against the ravages of decay, and (2) promotion of gingival health from proper recontouring of the cervical third of the crown.

2. The band impressions are coated with colloidal graphite. Gently wrap masking tape around the impression. Use three-quarter inch, wet or dry masking tape rather than wax as it is less likely to warp the impression and the resultant plating is much cleaner with no overhanging copper.

3. The impression is plated overnight to give a sufficient thickness of copper. Wrap masking tape around the plated impressions and pour low fusing metal to form the dies. Trim and finish the dies.

4. Construct transfer casts by again wrapping masking tape around the plated dies. Pour a low fusing metal which has a fusing point lower than the metal from which the die is constructed. Trim and finish the transfer cast.

5. The transfer casts are placed on the preparations in the mouth. Check the gingival extension of the casts; if satisfactory take a plaster impression of the mouth with the casts in position.

6. The dies are lubricated and seated in the transfer casts; lute die to the casts with sticky wax. Coat the plaster with a separator, such as water glass diluted with equal parts of water.

7. Dry impression and pour the stone models. Register the patient's centric occlusion at this time.

8. The stone models are articulated, using the registrations recorded of the centric occlusion. (No attempt is made here to describe a technique for the registration of the proper centric as that is a subject for a paper in itself.)

9. Remove the models from the articulator and place on the surveyor. Tilt the model to the desired angle and design the contour of the crowns (Figs. 4, 5, 6, 7, and 8).

Designing the Crown—A thorough knowledge of clasp surveying is required for designing the contour of the crown. Excellent study on proper clasp design has been done by Schmidt[4] and Blatterfein.[5]

Departure from Conventional Technique—The conventional technique utilizes clasp design to achieve proper clasping. In the technique under discussion proper clasping is achieved by utilizing proper crown design. The clasp design that it is desired to achieve can be dictated in the mind; a crown can then be designed to conform to the mental image of the finished clasp. Draw the survey line on the crown; then trim the crown to create undercut areas and non-undercut areas.

Factors Affecting Design—The design of the crown will be affected by the following features:

1. Esthetics: The crown may be designed so that the clasp will hug the gingival of the tooth.

2. Periodontal Health of the Tooth: McCall[6] states that the buccal and lingual arms of the clasp should exert equal pressure on the tooth and should not disturb the tooth upon the insertion and removal of the denture. The cervical third of the crown should be carved so that food will be deflected from the gingival tissue, however, not overcontoured, lest food collect there and irritate the tissue.

3. Position of the Tooth: A badly tilted tooth may limit the clasp design.

4. Retention of the Partial Denture: The basic concepts of clasp design are utilized to the fullest. Contour the crown so that the clasp will have non-undercut areas along the body, or bracing portions of the clasp, and undercut areas for the retentive part of the clasp.

5. Additional Retention: By placing a slight bulge above the distal or

[3]Glickman, Irving: Periodontal Response to Partial Dentures, J.A.D.A. **37**:311-316 (Sept.) 1948.

[4]Schmidt, A. H.: Planning and Designing Partial Dentures, DENTAL DIGEST **54**:498-502 (Nov.) 1948.

[5]Blatterfein, Louis: A Study of Partial Denture Clasping, J.A.D.A. **43**:169-185 (Aug.) 1951.

[6]McCall, John Oppie: The Periodontist Looks at the Clasp Partial Denture, J.A.D.A. **43**:439-443 (Oct.) 1951.

retentive section of the clasp additional retention may be secured. The retentive arm will slip over the bulge and be held snugly.

The Occlusal Recess—(1) This should be designed so that the occlusal rest will blend into the occlusal contour of the tooth. (2) The shape of the recess is a modified box form. (3) The corners are rounded and the recess is tapered to permit ease in casting the rest. (4) Elevate the recess on the distal section to prevent distal slipping of the clasp. (5) In the mouth, with missing teeth only in one quadrant, the occlusal recess can be designed to permit crossing over of the clasp arm so that there is no interference with occlusion.

Completion of Technique

1. The crowns are completed on the model in wax as far as is possible but the final adjustments are made by checking the wax patterns in the mouth.

2. The buccal cut-out for the acrylic veneers are marked in the mouth and the gingival margins are checked. The shade is taken at this time.

Use of Shade Guide—The shade of the acrylic on the finished crowns is dependent upon many factors: (1) the background color of the gold, (2) thickness of acrylic used, (3) the masking substance used, and (4) the type of commercial acrylic utilized. Since the final shade is dependent on these factors, the ordinary shade guides are not adequate.

Construction of Guide—A shade guide employing the same determining or controlling influences upon the final shade can easily be constructed and will reward the operator in the final result:

1. Use plastic teeth to construct the guide by cutting out windows in the tooth. Invest, burn out, and cast in gold.

2. Plate the gold to the desired background,[1] mask as for the final product.

3. Cure the acrylic of choice. Compare the shades with the conventional shade guide and the difference will be obvious.

Final Steps

1. Return the wax patterns to the model and finish the buccal cut-outs.

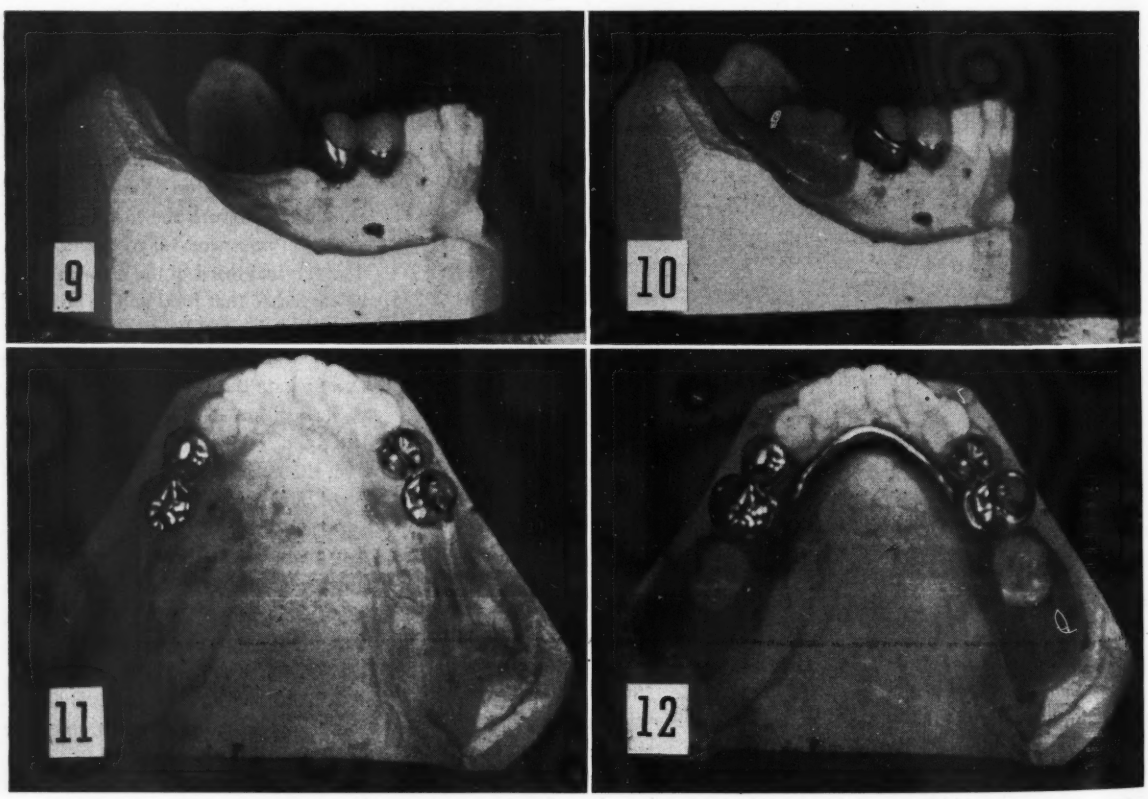
2. Adjust the occlusion by touching up the carvings that were altered in the mouth.

3. Cast the wax patterns in the routine manner.

4. Single abutments may be finished with the acrylic windows at this time. However, multiple abutments must be returned to the mouth for plaster impressions.

5. The gold crowns are withdrawn in the plaster impressions and the dies are seated in the crowns. Separating material is painted on the impression and stone models are poured. Solder the multiple abutments together at this time.

6. The partial denture is constructed on the stone model in the conventional manner with the excep-



9. *Side view of finished gold cast crowns.*

10. *Side view of partial denture in place.*

11. *Top view of finished gold cast crowns.*

12. *Top view of partial denture in place.*

tion that there are prearranged undercut and non-undercut areas for clasp design. Finish the acrylic windows on the multiple abutments and the case is ready for try-in.

7. The crowns are cemented in the mouth with temporary cement until the operator is sure that the patient is comfortable. A cement that will not set too hard is indicated as it may become difficult to remove the crowns. When satisfied that the case will function properly, cement with permanent cement.

Summary

The advantages of using gold cast crowns as retainers for partials are the following:

1. The problem of caries around the abutment teeth is minimized. The crowns are constructed so that the margins are below the gingiva to the base of the gingival sulcus.

2. Weak teeth may be supported by multiple splinting. This may be accomplished as it is in occlusal reconstruction by joining adjacent teeth together.

3. The abutment teeth can be designed to suit the partial by carving the wax crowns on a surveyor. The undercut areas and non-undercut areas are made in the wax patterns. The clasps can be designed where they will serve best.

4. Esthetics can be improved by designing the partial so that unsightly clasp arms are kept out of sight or hugging the gingival tissue.

5. Greater stability and retention can be achieved from such a planned partial.

6. The occlusion may be adjusted and individual teeth recarved to blend in better with the rest of the mouth.

A technique has been described to construct such retainers for a partial denture.

701 *Hamilton Avenue.*

Atypical Trigeminal Neuralgia

BRODIE HUGHES, Ch.M., F.R.C.S., Birmingham, England

Clinical Picture

1. The disease consists of a severe, lancinating and paroxysmal pain in the trigeminal distribution occurring in the middle-aged and elderly, although examples are sometimes encountered in the young.

2. The attacks are of brief duration, lasting but a few seconds, and are brought on by touching the face, by a breath of cold air, by eating, talking, and often by emotion.

3. The pain never escapes the confines of the trigeminal nerve, is usually on one side only, and runs a fluctuating course, often clearing completely in the warmer weather, only to recur with cold and damp.

Pathology Unknown—There is no known pathology to this condition. Whatever role dental disease may play in its etiology, dental treatment, even when the disease is severe, plays no part in therapy. For most the cure lies in paralysis of the trigeminal nerve (A) by injection of the ganglion, or (B) by surgical section of the posterior root. The characteristics of the disease are (1) the sudden attacks of sharp pain, (2) the absence of any abnormal physical signs or any discoverable pathology, and (3) the protracted course.

Deviations from Type—Cases which do not conform to the typical clinical picture are usually referred to as "atypical trigeminal neuralgia" and can be roughly divided into two main groups: (A) Those in which the neuralgia is symptomatic of some well-defined condition, such as growths affecting the Gasserian ganglion or its branches, and (B) those cases in which, like the true trigeminal neuralgia, no pathology is discoverable.

Symptomatic Group—(1) Such conditions as malignant growths of the upper jaw must be considered, often occurring in the cavernous sinus region but affecting the trigeminal ganglion itself.

(2) Benign tumors may affect the ganglion or its root, such as meningioma of the Gasserian envelopes, neurofibroma of the trigeminal nerve, and tumors lying in the cerebellopontine angle, such as neurofibroma of the eighth nerve.

(3) Aneurysms of the carotid artery in the cavernous sinus always come to affect the trigeminal ganglion and its branches. These aneurysms may be mere dilatations of the carotid artery or true saccular or dissecting aneurysms.

(4) A few conditions other than tumor and aneurysm may affect the nerve, chief among these being disseminated sclerosis and syphilis.

Clinical Characteristics—Not only will there be pain in the distribution of the nerve, but its function will be affected as well. As a result, testing of sensation on the face and forehead will disclose some degree of sensory loss and when the first division is affected the corneal reflex will be diminished or absent. Where the third division is affected motor fibers will be included in those paralyzed with consequent weakness of the masseter and temporal muscles on that side.

Factors Aiding Diagnosis

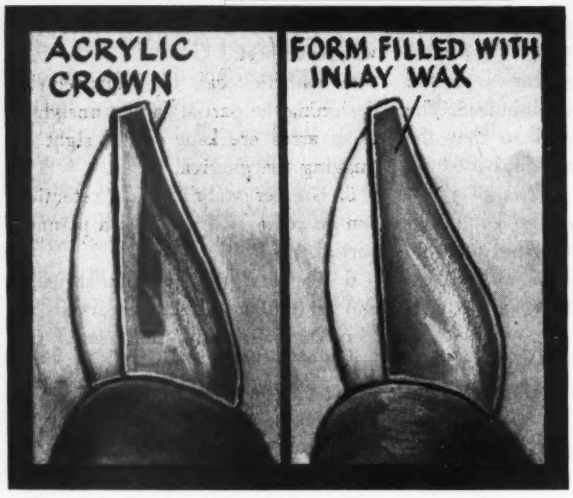
1. When pain is accompanied by disturbance of objective sensation and particularly when there is motor weakness as well, the lesion is an organic one and probably a space-occupying lesion such as an aneurysm or tumor.

2. In many instances additional physical signs will be present to suggest the primary diagnosis. These will vary from case to case according to the nature of the lesion.

3. X-rays and other more complex investigations may be needed to determine the exact condition present. This diagnosis is usually referred to the neurosurgeon or neurologist for final elucidation and treatment.

Heterogeneous Group of Conditions—The group of symptoms with which this paper is primarily concerned and which presents some difficulty in diagnosis comprises (1) cases of pain in the fifth nerve distribution occurring after injury or

(*Continued on page* 233)



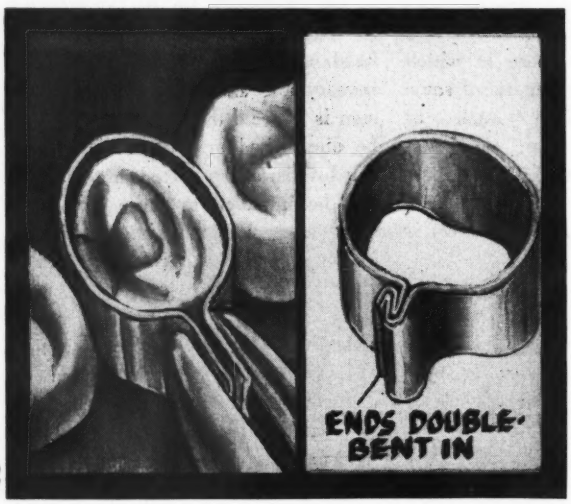
1

Clinical and Laboratory

Direct Pattern for Three-Quarter Crown

J. W. Powley, D.D.S., Hammond, Ind.

1. Adapt an acrylic crown form to fit the three-quarter preparation. Cut away the labial portion. Lubricate the inside of the crown form with oil before filling it with wax. After the wax has been adapted to the preparation, remove the crown form and complete the carving of the pattern.

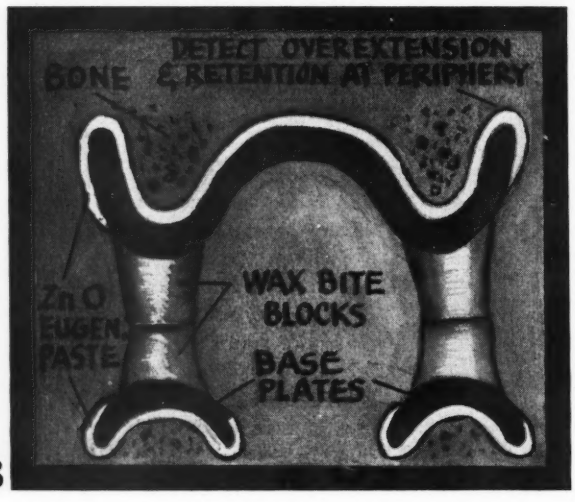


2

A Self-Retaining Matrix Band

I. J. White, D.D.S., Modesto, Calif.

2. Cut a piece of steel matrix material one-half inch longer than the circumference of the tooth. Place the strip around the tooth and snub tightly with flat nose pliers. Remove the band and make a *double* bend in the projecting end of the strip. Festoon, replace on the tooth and use a wooden interproximal wedge to secure a tight fit at the gingival.



3

Baseplate Stability

William J. Klink, D.D.S., Middletown, N.Y.

3. Adapt baseplates to the models and allow a 2-millimeter space around the entire periphery. Using the baseplates as trays, take an impression of the secondary models with zinc oxide-eugenol paste. Obtain a roll of impression material to simulate the peripheral form of the finished denture. The trial rims developed by this method will be stable to allow for accurate registrations.

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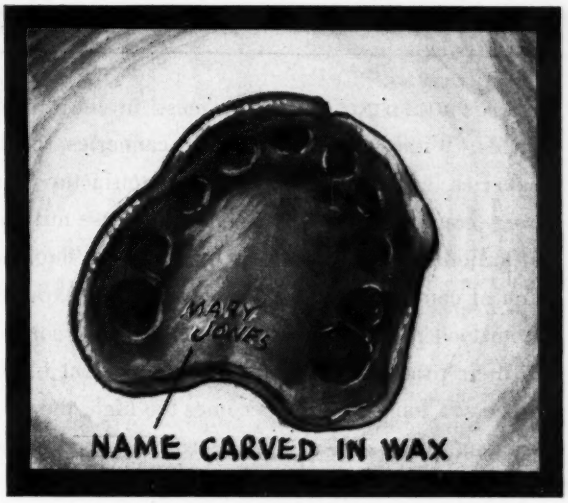
SUGGESTIONS . . .

An Aid to the Application of Sodium Fluoride

M. Gittelson, D.D.S., Brooklyn, N.Y.

4. Soften a roll of bite wax and instruct the child to close his teeth into the wax. Remove and dry the wax bite and place sodium fluoride paste in the impressions of the upper and lower teeth of the wax bite. Reinsert the wax after drying the teeth and have the child hold his teeth in a closed position for three minutes. All surfaces of the teeth are thus exposed to the sodium fluoride and the solution is held in close contact with the teeth. Save the wax bite for succeeding treatments.

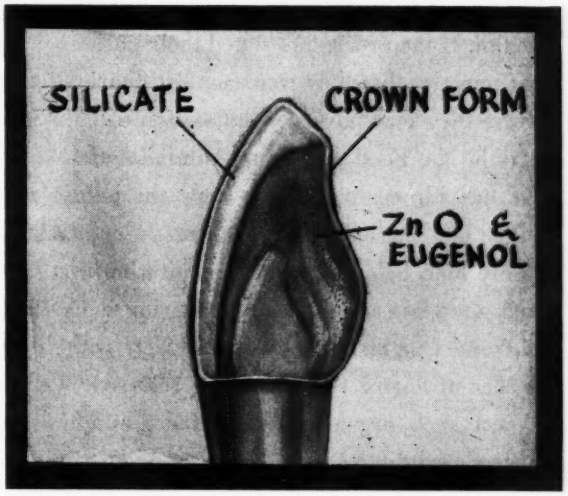


4

An Esthetic Temporary Crown

L. W. Schmidt, D.D.S., Houston, Texas

5. Coat the inner labial surface of a crown form with silicate cement and adapt to the tooth. Remove the crown form before the cement has hardened. Fill the rest of the crown form with a mixture of zinc oxide-eugenol and carry the form to place. This temporary crown has the advantages of a good color match and a restoration that is not irritating to the pulp.

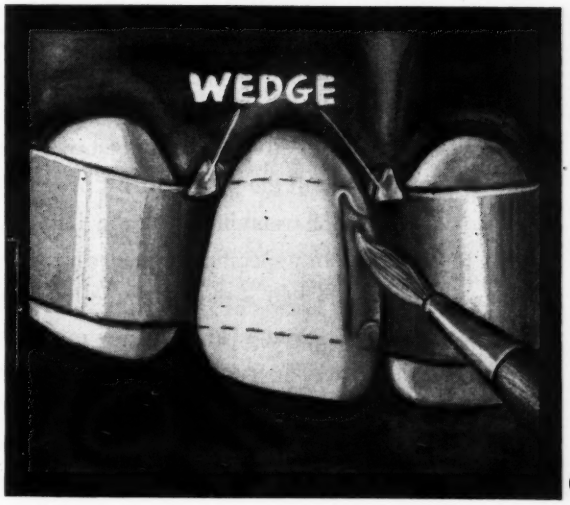


5

Lingual Matrix for Self-Curing Acrylics Using the Brush Technique

Lt. Jay W. Friedman (DC) USAFR, Forth Worth, Texas

6. A stainless steel matrix is interwoven through the teeth as illustrated. The lingual wall is adapted with a burnisher. Wedges are used to hold the matrix in position.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 230 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

FOOD PROCESSING is big business in the United States. Witness the number of canneries, mills, bakeries, candy factories, drink manufacturers in every community. All these businesses use millions of gallons of water a year. Opposition to fluoridation of community water supplies may be expected from food processors who use public water sources in their procedures. If the fluoride content of the processed food or drink becomes too high, the Government may confiscate or destroy the product because of these chemical "impurities."

Any attack these food processors make against fluoridation will not be a frontal one. It will be oblique and disguised as a protection of the public health. If the processors stated their position frankly; namely, that they were against fluoridation because they fear possible confiscation of their products by the Food and Drug Administration should the fluoride content be too high, the public could judge the case on these arguments. The attack will likely hide behind a front organization that has a high-sounding and scientific appearing name. Spurious and convincing "scientific" facts with liberal dashes of horror stories will be released. We may expect such organizations to be substantially financed and directed by masters of propaganda. We may also expect the dental profession to be subjected to ridicule and violent abuse. There are signs that campaigns of this kind are being brewed.

It is nothing new in American business for a group of manufacturers in a certain industry to create an organization for institutional advertising. A per cent of the total advertising budget of a company is set aside to tell the public why *a* product or service is good. The remainder of the budget is spent to advertise *the* specific product or service. Not too many years ago a dental council was organized and on it served several of our extremely prominent dentists. The council was liberally financed by a group of manufacturers of a widely used American confection that requires sustained masticatory effort. The intent was to show that the confection was not harmful to the dental health of American children but was an actual aid to oral cleanliness and the development of good jaws and faces. This activity represents a positive approach to put a product in good light and to surround it with an aura of scientific respectability.

The anticipated action against fluoridation would be expected to take a negative form. It would be intended to show why something should *not* be done. In this case why fluoride should not be added to communal water. In a negative action it is always easier to scare and panic people by picturing the dire things that will befall them if a course of action is followed. It is not necessary to be scrupulous with facts. In positive arguments it is expected that evidence be presented and proof be shown. It is much easier at this time for the opponents of fluoridation to conjure up all manner of horrible examples of what will happen if fluoride is added to community water than it is for the proponents to show the positive evidence of the good that will come if fluoridation is carried out.

The array of scientific organizations, none with an axe to grind, that have expressed for fluoridation is impressive: the American Dental Association, American Medical Association, National Research Council, American Public Health Association, Association of State and Territorial Health Officers, and the U.S. Public Health Service. Not one of these organizations would gain a thing if the caries rate for American children is reduced. Actually, some of these groups, notably dentists, are promoting a measure that will reduce the volume of dental practice. It is difficult for some people to understand why a group works so hard to put itself out of business!

When the food processors open up with their heavy guns in attack against the American dental profession we hope that persons in influential positions will tell the public that dentists will gain nothing, but will actually lose patronage, if the caries rate is reduced forty or more per cent.

MEDICINE and the Biologic Sciences

Diet in Cardiac Disease

There are two basic aims in the management of cardiac disease: (1) Reduction in the work load of the organ as much as possible, and (2) providing as much rest for the organ as possible.

Cardiac activity is increased by ingestion of food. The heart functions under disadvantageous conditions after a heavy meal. Distention of the stomach elevates the diaphragm thereby displacing the heart upward.

Obesity constitutes a handicap to circulation and respiration. In the presence of cardiac failure this may become a serious factor due to the elevation of the diaphragm, decrease in volume of the lungs, and change in position of the heart. Adiposity of the cardiac muscle may be a factor in impairment of adequate myocardial function. Obesity increases the work of the heart during exertion, for the muscles must move a larger mass.

One of the foremost aims of a dietary program for cardiac disease is reduction in weight if the patient is obese. The low caloric diet serves to eliminate excess weight and to maintain cardiac effort at as low a level as possible.

Diet is of paramount importance in the treatment of cardiac decompensation or congestive heart failure. In this condition the myocardium fails to perform adequately its function of propelling the blood forward through the circulatory system. As a result there is a disproportionate amount of blood in the vascular system on the right side of the heart. Venous return is retarded and stasis results. In turn, fluid is diffused from the blood stream across the walls of the blood vessels into tissue spaces of the lungs and liver and into peripheral tissues. Impaired excretion of sodium by the kidneys results in retention of salt in these tissues which further increases storage of excessive amounts of water in the tissues because of the water binding properties of sodium.

The edema developing in patients with congestive heart failure is due to decreased cardiac output. The kidneys are unable to excrete salt or water adequately. The excess of sodium and water is stored in tissue spaces as edema fluid. As a result of this series of events the other symptoms and signs of cardiac decompensation develop.

An acid-ash diet sharply restricted in salt but with an abundance of fluid is advocated. This form of treatment in conjunction with administration of digitalis and mercurial diuretics and other commonly accepted measures is quite satisfactory.

Salt is restricted to a daily ingestion of 1.5 to 2.0 grams. Diuresis may be enhanced by the free ingestion of fluid depending on the desire of the patient up to 3,000 cubic centimeters daily. These two factors are of vital importance in the dietary management of the cardiac patient.

Odel, Howard L.: The Importance of Diet as a Therapeutic Measure in Cardiovascular Renal Disease, Med. Clin. North America **35**:1101-1111 (*July*) 1951.

Dermatoses in Geriatrics

The longevity of the human race has been increased because of advancements in preventive medicine and definite improvements in diagnostic and therapeutic procedures. There is a gradual increase in the percentage of population over sixty years of age. The health problems of this group are becoming more common in practice.

Birth starts the insidious process of aging which terminates at death. The complex changes caused by aging do not occur at a uniform rate in all persons. Factors influencing this rate are: (1) heredity, (2) acute illness, (3) nutritional and metabolic disturbances, (4) personal habits, and (5) occupational hazards.

Nursing and therapy are presented with special problems arising from the degenerative changes and chronic incurable diseases common in the aged group. Mental deterioration of elderly patients often presents special problems. The rate of recovery of elderly patients is slower than in younger ones. As a result, lack of cooperation and impatience of elderly persons augment the difficulties of the physician and other attendants. This is particularly true in the management of recalcitrant and tormenting pruritis and dermatitis, or eczema.

Probably the first and most easily recognized changes caused by aging are cutaneous manifestations. The skin becomes dry, less elastic, wrinkled, thin and scaly. Loss of cutaneous and subcutaneous fat is often an early manifestation. The obliteration of youthful features frequently is quite distressing to women approaching senescence. Graying and loss of hair usually precede atrophic changes involving the skin.

Loosely adherent seborrheic scales and crusts appear on the face and pigmented spots or senile freckles develop on the face, neck, and dorsal surfaces of the hands. These lesions are often precursors to precancerous senile keratoses. With advancing age the color of the skin changes from pink to a yellowish or grayish tint.

Pathologic changes of senescent skin consist of atrophy of the epidermis with increased pigment in the basal layer. Because of degeneration and loss of elastic tissue in the corium, the epidermodermal juction becomes flattened. The corium is decreased in thickness. Blood supply to senile skin is decreased because of sclerosis of vessels.

These changes predispose the senile skin to infections and favor the development of gross degenerative lesions. Also they are responsible for recalcitrant dermatitis affecting elderly persons. The rate of recovery may be influenced by: (1) concomitant metabolic disturbances, (2) nutritional deficiencies, (3) cardiorenal disease, (4) arteriosclerosis, and (5) other manifestations common to this age group.

The common dermatoses noted predominantly during senescence or senility are: (1) senile angioma, (2) senile sebaceous adenoma, (3) senile verruca, (4) senile keratoses, and (5) basal and squamous cell carcinomata. Senile pruritis and various types of dermatitis are common. These are difficult to manage.

The basic principles in the management of dermatitis are the same as those for all age groups. The course of dermatitis in patients past sixty years of age is altered by the degenerative changes of senile skin and other biologic changes incident to aging.

Netherton, E. W.: Common Geriatric Dermatoses, J. Michigan Soc. **50**:495-500 (*May*) 1951.

Vitamin D Intoxication

Massive doses of vitamin D are frequently prescribed. Intoxication from the vitamin is possible although the exact incidence is not known.

There is a wide variation in individual susceptibility. Some patients display toxic symptoms on as little as 50,000 units per day for a few weeks. Others may tolerate ten times that dosage for six to twelve months before manifesting toxic effects of the medication. High dietary calcium and probably preexisting renal disease predispose to early appearance and enhanced severity of intoxication.

The hypervitaminosis D syndrome is characterized by several symptoms: (1) There is a general weakness, fatigue and weight loss. (2) Usually nausea, vomiting, diarrhea and abdominal cramps are present. (3) Headache, paresthesias and vertigo are frequently noted. (4) There may be variable mental symptoms such as depression, mild psychosis and stupor. (5) Albumin, red cells and casts are found in the urine. There is a progressive impairment in concentrating ability, frequency, and nocturia. (6) An elevated serum calcium and phosphorus, with normal or slightly elevated alkaline phosphatase is recorded. Progressive nitrogen retention is observed. (7) The roentgenogram reveals diffuse demineralization of the bones in advanced cases and periarticular soft tissue calcifications. (8) Scattered calcium deposition is found in the kidneys, blood vessels, periarticular soft tissues, heart, stomach, lungs, thyroid, and pancreas. All or only a few of these symptoms will be found, depending on the severity of intoxication.

The prognosis may generally be considered favorable following prompt cessation of administration of the drug and early institution of indicated therapeutic measures.

Fortunately, the syndrome is slow in its development. This permits detection of intoxication early, before significant damage has occurred.

When the drug is used patients should be informed of the nature of the toxic symptoms to permit voluntary cessation of treatment if these symptoms appear. Routine urinalysis and hemoglobin determinations should be checked at least every two weeks during treatment. Blood calcium determinations should be followed at monthly intervals.

The treatment is directed toward: (1) cessation of vitamin D intake, and (2) reduction of serum calcium level by restriction of calcium intake and encouragement of maximum urinary excretion.

Chaplin, Hugh, Jr.; Clark, Lincoln D.; and Ropes, Marian W.: Vitamin D Intoxication, Am. J. M. Sc. **221**:369-374 (*April*) 1951.

Aspiration During General Anesthesia

General anesthesia carries with it the risk of aspiration of gastric contents. This may be a serious and often fatal accident.

Vomiting is only a part of the problem. Silent aspiration of gastric contents by the deeply anesthetized patient is common. About one-fourth of deeply anesthetized patients show some degree of regurgitation. In many of these patients gastric contents are aspirated into the lungs.

Regurgitation occurs much oftener when the patient is in the Trendelenburg or the lateral position than when he is in the horizontal supine position. Gastric tubes are protective, presumably by keeping the stomach contents low in volume.

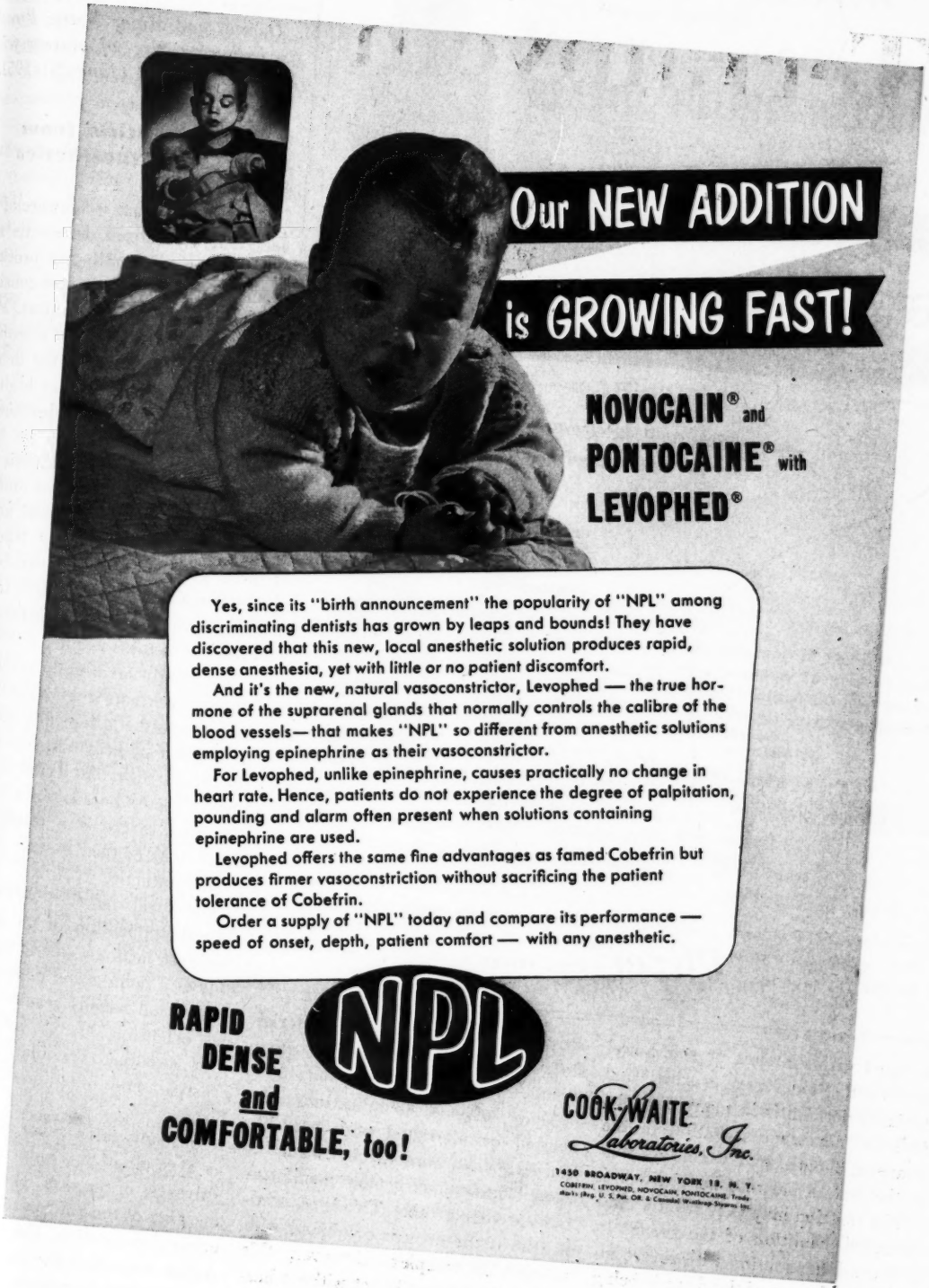
When the stomach is not empty, pressure on it by the surgeon during work in the upper abdomen may possibly force gastric contents into the pharynx. The volume of the aspirated material may produce fatal obstruction. However, the irritant and infectious action of the aspirated material may also be serious.

The stomach should be emptied by induced vomiting when emergency surgery must be undertaken. Even fifteen to twenty hours after the onset of an emotional crisis or a painful injury the stomach may still hold whatever contents it had at the beginning of that time.

Culver, G. A.; Makel, H. P.; and Beecher, H. K.: Frequency of Aspiration of Gastric Contents by Lungs During Anesthesia and Surgery, Ann. Surg. **133**:289-293 (*March*) 1951.

Complications Following Aureomycin Administration

Aureomycin medication has been identified as the cause of proctitis as-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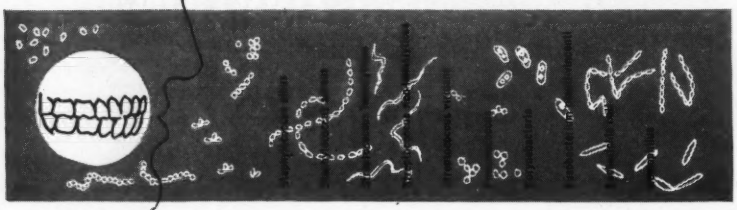

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sociated with diarrhea or soft bowel movements, tenesmus, pruritis, and perianal dermatitis in many patients. Mucous membrane irritation in the pharynx, mouth, and vagina as well as the rectum has also been noted.

The reaction may vary from a mild catarrhal condition of the tissues to a severe inflammation with severe ulceration. The use of the drug is being limited to its specific indications by many clinicians because of the frequency of the complications.

Chloramphenicol may cause similar but less severe reactions. Allergic sensitivity and a change in the bacterial flora are said to be the causative agents.

Many of the complications are averted or alleviated with antihistamines. When aureomycin is administered intravenously the manifestations are less notable. This is especially true if the drug is combined with vitamin B complex. However, this mode of treatment is not without hazard to veins. It must be carried out with extreme caution.

Usually all manifestations in most patients will improve spontaneously over a period of three to six weeks. Most patients can be kept comfortable during this period with the usual antidiarrheal and antipruritic drugs.

Queries and Minor Notes: Proctitis Following Use of Aureomycin, J.A.M.A. **146**:767 (*June* 23) 1951.

Dermatitis from Local Anesthetics

Many dentists are well aware of the fact that a localized dermatitis may result from the handling of procaine. Such a dermatitis may cause considerable disability and discomfort. Many clinicians regard the local anesthetics as occupational hazards for dentists. This is so because a rather high proportion of dentists have become sensitized to local anesthetics.

Similar cases of dermatitis have been noted among users of ointments and creams containing local anesthetics. This is particularly true with those given to relieve pruritis. Also the presence of an already irritated skin is conducive to dermatitis in the presence of these agents.

The condition usually occurs as a localized dermatitis from contact with a local anesthetic topically applied or as a result of becoming sensitized to the drug. Such an irritation almost always occurs because of a hypersensitiveness of the skin resulting from a previous contact to that particular local anesthetic.

The local reaction following the topical application of an agent containing a local anesthetic may appear only as a redness and itching. Further application usually results in a gradual extension of the inflammation, with swelling, vesiculation, oozing, crusting, and often marked discomfort.

In many cases, other areas appear as a result of the induced hypersensitiveness of the skin. There may be a merging of the patches to form a generalized dermatitis. The original condition for which the local anesthetic was applied is greatly exaggerated. The convalescence is usually slow and protracted even with the most careful handling of the patient.

Such a reaction may follow the use of any of the following local anesthetics: (1) orthoform, (2) procaine hydrochloride, (3) butesin, (4) pontocaine, (5) benzocaine, and (6) butyn. In using any of these agents for topical application it is wise to be alert for the occurrence of epidermal hypersensitivity at any time.

Lane, C. Guy, and Luikart, Ralph: Dermatitis From Local Anesthetic, J.A.M.A. **146**:717-721 (*June* 23) 1951.

Significance of Delayed Development in Cerebral Palsy

Normal or abnormal neurologic status during infancy and early childhood can be predicted with an amazing degree of reliability by the rate of development. Slow development in early life may be the only indicator of cerebral palsy.

The range in normal rate of progress is wide. Wide deviations, however, have more serious implications than are often recognized. This is particularly true when more than one developmental item is slow in onset. Occasionally a child may not speak sentences at the usual time and still be normal. However, if other items such as sitting and walking are also delayed, then failure to speak may indicate a more serious prognosis.

The developmental items usually noted are: (1) erection of head from prone position, (2) reaching for objects, (3) crawling, (4) sitting without support, (5) prehensile grasp, (6) single words, (7) standing alone, (8) walking alone, and (9) two or three-word sentences. The accuracy of these items is usually quite reliable as far as the parents are concerned.

The normal infant usually can lift his head upward from the prone position for short periods during the first month of life. It is significant if a baby fails to erect his head from prone position after three months of age. Usually the infant reaches for nearby objects from three to five months of age. The infant when normal will usually sit without support from six to eight months of age. If he cannot sit independently by ten months of age an abnormality is considered to be present.

Usually, the normal infant can crawl, dragging the body along the floor and drawing his legs after, by seven months of age. It is abnormal if this item is delayed beyond eight months. An infant can promptly grasp an object between the thumb and forefinger by nine months. Delay beyond eleven months is abnormal.

Single words such as "mama," "dada," "doll," or "ball" usually can be vocalized by nine to eleven months of age. Abnormality is considered present if this item is delayed until twelve months. The normal infant can usually stand alone by twelve months. The late normal limit for this is thirteen months. He can walk alone between twelve and fifteen months of age. It is abnormal if the infant cannot walk alone until after eighteen months. By twenty-four months the normal infant can speak two and three-word sentences like "Want ball"

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and "Me go out." Delay until thirty months is not considered serious.

It would seem quite obvious that a cerebral palsied child would be slow in developmental progress. This does not invariably hold true in practice. An infant may be bright, alert, and develop quite well yet have minimal or varying signs of neuromotor dysfunction or both. Therefore many mild cases go undetected until later in childhood. About 70 per cent of the cases are delayed in development very early in life.

The chances for serious prognosis are particularly increased when several steps in development are delayed beyond the late normal range. These delays are not specific for cerebral palsy but can apply to other conditions which are associated with developmental retardation.

It appears that a child who speaks sentences at the usual time may or may not be retarded. If speaking sentences is delayed beyond thirty months there is great likelihood that the child will be retarded at the borderline level of intelligence or below.

Denhoff, Eric, and Holden, Raymond H.: The Significance of Delayed Development in the Diagnosis of Cerebral Palsy, J. Pediat. **38**:452-456 (*April*) 1951.

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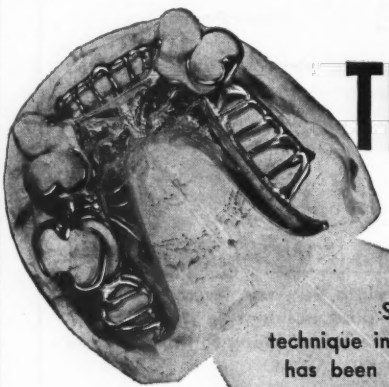

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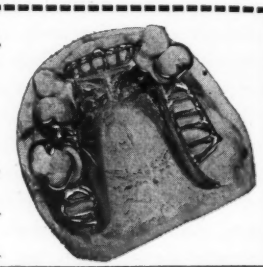


Tonsillectomy and Adenoidectomy in the Presence of Cleft Palate

Children who have undergone surgical correction for congenital cleft palate present a problem when tonsillectomy and adenoidectomy are considered. Depending on the operator and the surgical procedure of the original cleft palate operation, the deglutitory and phonetic results should be extremely satisfactory as the child develops.

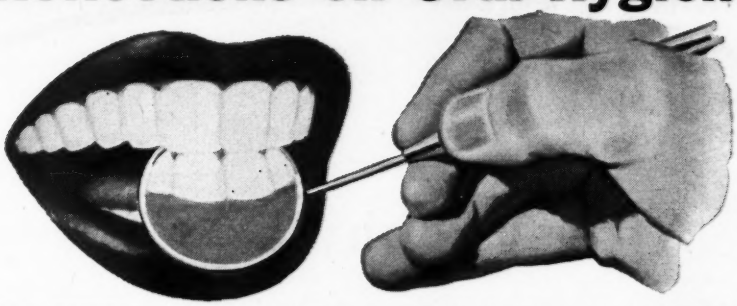
In some cases in which the cleft palate has been closed and a good result secured, the physician is reluctant to have a tonsillectomy done, fearing a resultant speech defect. Later the lymphoid structure in the oropharynx and nasopharynx, as a rule, naturally undergo changes to such an extent that complications ensue, usually at the ages of two to six years. Such complications are the result of lymphoid structure infection with hypertrophy. The changes occur principally in the palatine tonsils and nasopharyngeal adenoid mass.

When such a patient has local or systemic complications as a result of infection of these structures, the usual treatment must be instituted regardless of a previous cleft palate operation.

At birth, most of these patients have a normal palatal structures, but there is a failure of union. Except in rare instances, when the components are underdeveloped or extremely wide clefts occur, the patient will have satisfactory swallowing and speech functions if the operation has been properly managed.

During the first three years of life

Reflections on Oral Hygiene



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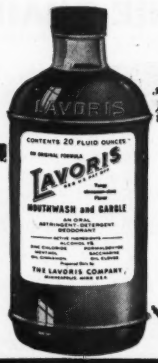
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Beatty, Hugh: Relation Between Tonsil and Adenoid Operation and Cleft Palate, J.A.M.A. **145**:379-381 (February 10) 1951.

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Whatever our particular brand of misfortune it seems to us to be the worst of its kind. Our lame back is far worse than the one our neighbor complains about. The long-rooted

weeds that grow on our lawn are more profuse and vigorous than the ones on our neighbor's plot of ground. The tires on our car always puncture at nighttime, in the rain, on a country road. Our friends have this experience in front of a service station from whence immediate help is cheerfully forthcoming.

And so it is in dental practice. The clinicians that I hear never have sore spots under the dentures that they make. Their patients never have one bridge abutment break loose from its cement moorings while the other shows an exaggerated tenacity. The oral surgeons who fracture roots and jaws and bury needles permanently in the warm red tissues never make public mention of these woes. The orthodontists that I hear say that they slip every tooth every time into precision gear position without patient discomfort and never with an increase in the caries rate. No endodontist who is worth his broach and who speaks or writes on his specialty fails to carry his root filling, neither too short nor too long, to the exact apical foramen. Listening to or reading the outpourings of these self-appointed perfectionists might give me a gnawing feeling of inferiority if I believed them. But I don't. When I see some of the patients that these experts have treated, I find that they have just as many troubles as the rest of us mortals experience—except ours, because they are ours, seem to be worse.

In the field of dental practice organization it is the same. Our laboratory technicians seem to be more fumble-fingered than they are in other parts of the country. Not only fumble-fingered, but they are completely disinclined to read written instructions or to listen to oral ones. Our dental assistants seem to have poorer memories, greater urges to rush to the restroom at inopportune times, and less skill at bookkeeping than those white gems of excellence that I read about in the dental journals. The dental hygienists that I know, if they occasionally condescend to radiodontics, have more trouble with their angles and solutions than I have myself, and that is considerable.

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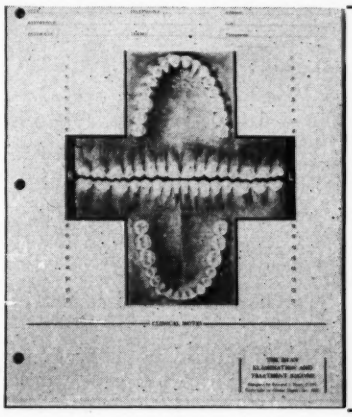

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And that phenomenal skill with the scalers that I have heard that hygienists possess has escaped the ones that I have seen in action or the one that once operated upon me.

When I am particularly perturbed over my inadequacies and those of my associates, I take courage by hunting up a colleague and urging him to give an unstinted recitation of his troubles both personal and professional. By making it plain to him that you will be a mere listening post and not a competitor in recitation who will top everything he records, you will put yourself in a favorable position. Let him know that he will have an exclusive opportunity to tell one of great understanding everything that disturbs him. At first, and before he warms up to his opportunity, he may concentrate on the general annoyances of mankind: poor weather, high taxes, interpersonal misunderstandings. As he develops confidence in you as a patient listener, he will begin to take you behind the scenes of his persona. He may admit that the apparent man of vigor and decisive action has moments when he is not too sure of himself and some of his physiologic processes. He may tell you that the new Cadillac and the Caribbean cruise were not bought and paid for out of savings but out of future hopes. In time he will tell you that he has woes and griefs and failures in dental practice although he would just as soon that his colleagues in the community and his patients didn't hear too much about them. But hearing about his miseries and frustrations your own are lightened somewhat. "Misery loves company," and

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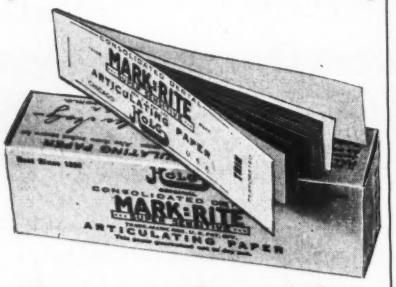

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(*See pages* 218 *and* 219)

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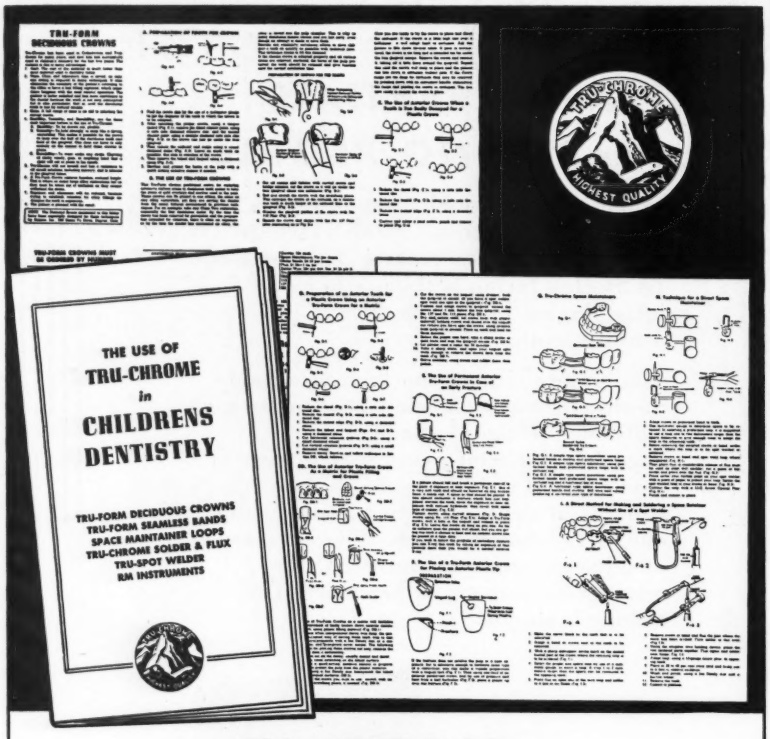
frustration is diluted in companionship.

Turning now to public discussions of dentistry's status, can you picture the United States Senate debating in detail the affairs of dentistry in the country? You can't? Neither can I. That is, however, exactly what was done in the British House of Lords. Whether a lord is more interested in public health and in professional advancement than is a senator, I do not know. One has the feeling too in reading these discussions that a lord knows more about the subject of dentistry than do most of our senators. I had always pictured the House of Lords as a stuffy assembly of old gentlemen steeped in heraldry and pompous in their powdered wigs. This debate on dentistry, as reported in the *British Medical Journal*, blasts my presumptions:

"In the House of Lords on February 5, Lord Woolton moved the second reading of the Dentists' Bill. He explained that the Bill was introduced to grant dentists the status and dignity of a self-governing profession, to regulate the admission of foreign and Commonwealth dentists to the dental register, and to provide for the training of ancillary dental workers. A new General Dental Council was to be set up, composed of 34 members, all but four being registered dentists. In addition, six members of the General Medical Council would act as members on the General Dental Council when matters concerning dental education were discussed. The visiting of dental schools, the registration of dentists, and disciplinary procedure would be transferred to the General Dental Council. The Bill gave a new right of appeal to the judicial committee of the Privy Council against a decision to remove a dentist's name from the register in the same way that that appeal had been given to a doctor in the Medical Act, 1950.

"The only new principle introduced in the Bill empowered the General Dental Council to establish classes of ancillary dental workers. The public dental service for expectant and nursing mothers and young children was in serious need of additional manpower. In December 1951, the equivalent of just over 700 full-time dental officers were employed on this work, whereas an adequate dental service for children would require some 2,800 full-time dentists. The number of dentists on the register was likely to increase, but slowly. Just before the war the annual entry into the profession was about 340; during the last five years between 600 and 650 students had entered dental schools each year. Expansion of the schools was costly and would be slow, and at the present rate of intake the number of 10,000 practicing dentists in England and Wales would not be greatly increased. Meanwhile the public would have an insufficient dental service. The Bill would enable the General Dental Council to give official recognition to oral hygienists, but provided they should only work under supervision of a registered dentist. The Government was considering whether ancillary dental workers, able to undertake the extraction and filling of teeth, as in New Zealand, should also be introduced. The Bill provided that the Dental Council should arrange for the training and subsequent employ-



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ment of a number of persons whose work would include extraction and filling, and that the Ministry of Health and Secretary of State for Scotland should be empowered to give financial help towards the cost of this experiment. A two-year training was envisaged, and after the first batch of dental workers had been employed for a year the council was to report on the experiment. If the results justified such action the council was authorized to proceed, in conjunction with the Privy Council, to draft regulations establishing such a class as ancillary workers.

"Lord Teviot said he did not agree that there were not enough dentists in the country to provide reasonable treatment for adult patients. When a moderate charge had been introduced for the supply of dentures the drop in the number of patients was most noticeable, and he believed that the new charge up to £1 would make a large reduction in the number of patients seeking treatment. There was no doubt that the schools and children were alarmingly short of treatment and inspection. He contended that a dental surgeon rather than an ancillary worker should do the filling of a child's permanent teeth, but at the moment it barely offered a living for the dental surgeon to become a children's dentist. Parliament had to offer an inducement of a reasonable return for such work.

"Lord Webb-Johnson declared himself in favor of encouraging the training of dental nurses, provided the limits of their activities were narrower than was laid down in the Bill. The dental nurse should not be permitted to interfere with living tissues. The auxiliary workers could be made technically competent, but would not have sufficient training to make them competent to form a diagnosis, especially during the eruption of the second teeth. Lord Amulree endorsed the plea for the foreign refugee dentists at present working in this country, and Lord Mancroft hoped that the misgiving concerning ancillary workers would disappear. He dissented from the description of the auxiliary workers as partially trained. It was not right to describe a hospital sister as partially trained. She was trained to do her own job.

"Lord Haden-Guest said the London County Council at present ought to have 66 dentists but had only 38. The deficiency in dental establishment amounted to a disaster which could not be made up. He was not convinced that, because of the charges now to be made for various dental services, dentists would go back to the school dental service. He believed that the setting up of a service of ancillary dental workers under the personal supervision of dentists would be valuable.

"The Bill was read a second time without a division."

—E. J. R.

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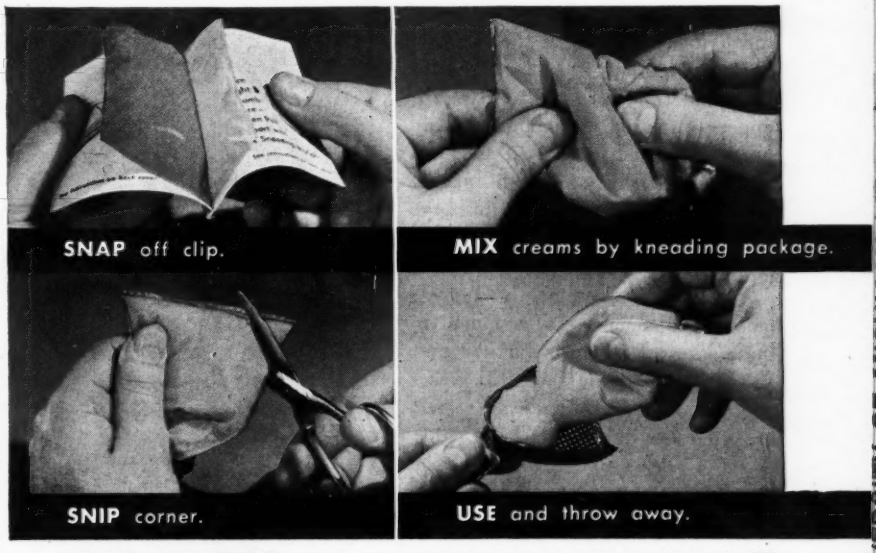

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Atypical Trigeminal Neuralgia

(*Continued from page* 217)

following herpes zoster, (2) cases exhibiting pain mainly of fifth nerve distribution but sometimes spreading beyond this and associated with secretory and vasomotor phenomena.

Resemblances in Cases—Considera-

tion of the group discloses striking resemblances: 1. The character of the pain is relatively constant. 2. It is a dull and aching pain often compared to dental neuralgia and is spread over long periods of time, remissions being infrequent and short-lived. 3. Paresthesia is often associated with this pain and it has the same distribution, notably a sensation of burning or hotness and a feeling as though something were creeping or crawling beneath the skin.

Symptoms of Pain—1. Where the pain spreads beyond the confines of the trigeminal distribution it seldom crosses the mid-line but may spread to other areas on the same side of the body. 2. Spread to the occipital region of the head, to the side of the neck and shoulder, and even to the upper arm is not uncommon. 3. Pain outside the distribution of the fifth nerve is usually of a dull aching character and seldom exhibits the paresthesia encountered in the facial region.

Phenomena—Secretory and vasomotor phenomena are common in these cases: 1. Watering of the eye, (2) flushing of the face, (3) vasodilation of the conjunctival vessels are often seen during attacks of pain; and (4) edema of the eyelids or of the malar region is sometimes noted. This pain is constant and wearing and by the time most patients appear for treatment some degree of psychologic disturbance has occurred.

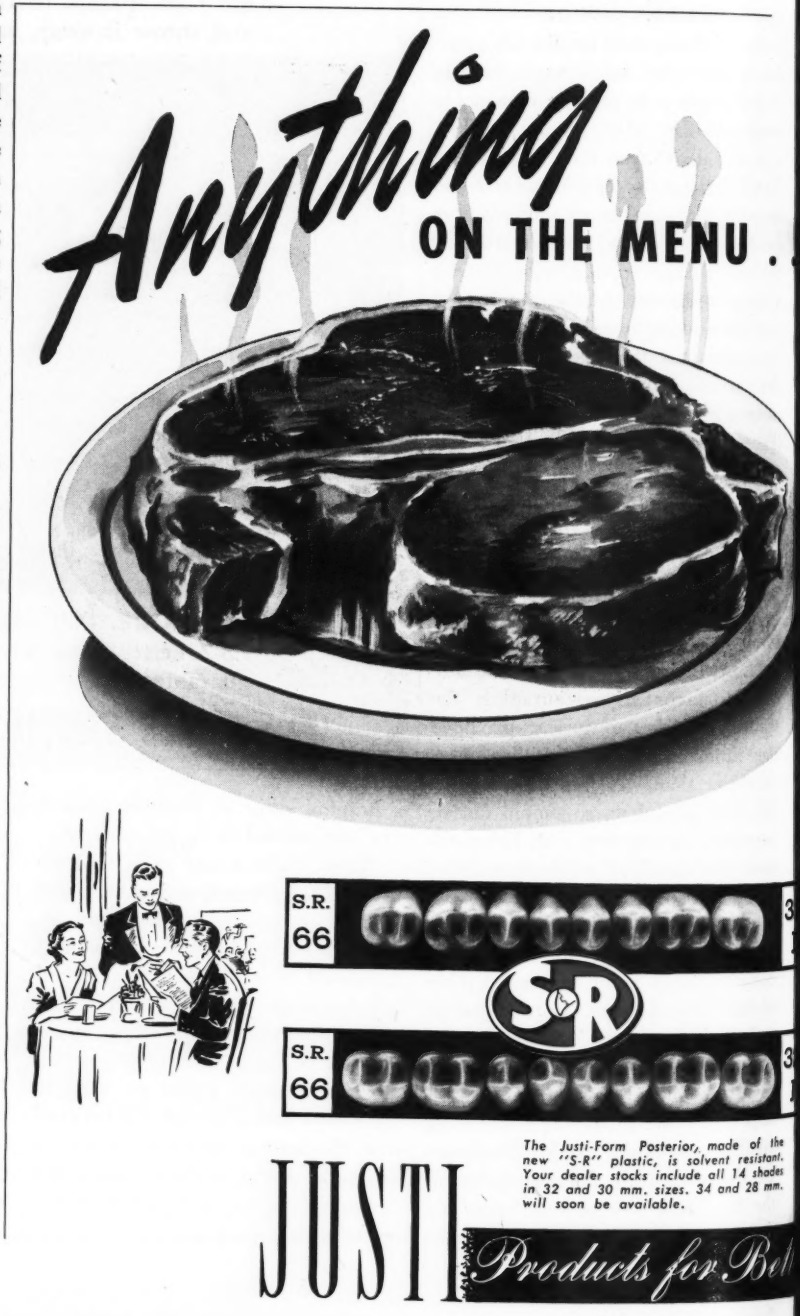
In some patients obsessional trends are obvious and in others the disease is associated with aggressive behavior. It is probable that the psychologic manifestations are merely latent in the patient and brought to light by the prolonged and unremitting illness, perhaps aggravated by the inability of the patient's medical attendant to bring relief.

Psychologic Approach Unavailing—Experience does not suggest that measures directed toward the psychologic abnormality help a great deal. Although some features may be relieved and the patient persuaded to accept his disability, the pain persists and only the strongest mind can be persuaded to accept it with equanimity.

Basic Explanation—Numerous clinical varieties of this syndrome are described. Migrainous neuralgia, sphenopalatine or Sluder's neuralgia, and facial psychalgia are some of the terms which have been applied to it. Each individual variety presents features common to the group.

Postherpetic neuralgia is the most clear cut of these symptoms for the antecedent herpes zoster establishes a primary pathologic process: 1. The first division of the fifth nerve is that commonly affected, though the process may be scattered throughout the fifth distribution. 2. Similar symptoms may result from herpes affecting other peripheral nerves. 3. There is usually extensive scarring of the skin in the distribution of the rash and partial analgesia and hypoesthesia may be noted. 4. The burning character of the pain is usually prominent and lachrymation may be a constant and distressing feature.

Similar Clinical States—(1) After surgical section of the trigeminal sensory root or injection of the gang-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lion, and more rarely after section of the descending root of the fifth nerve in the medulla, the clinical states referred to are seen. These conditions are rarely seen when the nerve or ganglion is affected by some pathologic process such as an acoustic nerve tumor or carotid aneurysm. (2) In these cases anesthesia in the distribution of the nerve section will be complete although the patient may still complain of pain and paresthesia. It is often difficult to distinguish real pain from other symptoms for anesthesia by itself may prove distressing to many patients who misinterpret the feeling of numbness and coldness as a painful sensation. (3) Ancillary phenomena such as lachrymation, vasodilatation, and edema are usually present.

Second Group—Another group of cases with a similar symptomatology have been designated as ciliary or sphenopalatine neuralgia according to the area affected. In these cases pain is similar in nature, in constancy, and type, but there is a greater tendency for the pain to spread to other areas.

Secretory Phenomena—1. Lachrymation and vasodilator phenomena in the conjunctiva or face are prominent features. 2. A similar condition also occurs after injury to the peripheral branches of the trigeminal nerve, and after facial injuries which do not seem to have produced any nerve damage. 3. In this group a comparison with similar conditions in the limbs betrays a striking resemblance.

Anatomy of Pain Nerves

It has been concluded that anatomically pain nerves subserving cutaneous pain and visceral pain differ only in one respect; whereas the distribution of pain nerves in the skin is a profuse one with considerable overlap.

Theory—It has been suggested that if by some means the distribution of pain endings to the skin was to be so reduced as to conform in pattern to that found in visceral pain-sensitive structures, then stimulation of such an area of skin might send to the central nervous system a pattern of pain impulses which would be indistinguishable in consciousness from that of visceral organs, and would be interpreted in the same way.

Reaction to Stimulation Would be Altered—Such stimulation, when reaching consciousness, would be interpreted as an aching, burning pain, ill localized and indistinguishable from that of visceral disease.

Some Features of Condition not Explained—Although the theory described is attractive it does not explain all the features of the condition: 1. Why one case of herpes develops pain and another not, why one scar is painful and another painless although the histologic picture may be similar. 2. It is also presupposed that the interpretation of pain of different types by consciousness is solely the result of differing patterns of peripheral stimulus, a supposition which has little factual support.

Composition—1. The trigeminal nerve appears to be a composite nerve comprising the old fifth nerve, originally of two roots only, and the sensory root of the third nerve. 2. There

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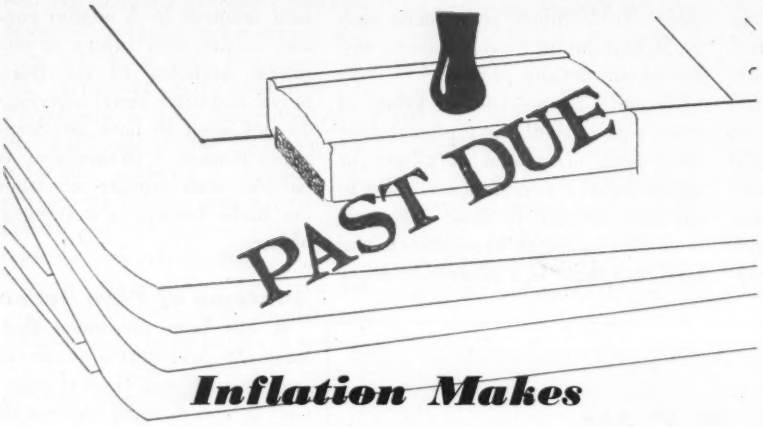

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Of course there will always be some slow-paying patients in almost every practice. What to do about them? . . . The article, "Are Collection Agents Good Business?" discusses the advantages and disadvantages of several methods of handling overdue accounts. Doctor Douglas W. Stephens says: "Experience has shown that, as accounts age, they become more difficult to collect, and losses are higher. It is said that a current account dollar shrinks to ninety cents at the end of three months, to fifty cents at the end of six months, and to thirty cents at the end of a year." That's without the additional shrinkage caused by inflation. These two articles certainly make one collection-conscious!

★ ★ ★

"Don't Make the Same Mistake . . . Once," cautions Doctor Lee A. Kapilow, and wins the O.H. award for the month for his article on accident prevention. Ever hear of a man being killed by a dental bur? Such an accident *can* happen in any dentist's practice—*has* happened at least once. Doctor Kapilow quotes case histories of this, and other accidents equally improbable and unpredictable, to emphasize the need for constant vigilance on the part of the dentist.

★ ★ ★

Doctor Jack F. Cathcart asks, as so many *patients* do, "Can You Guarantee Your Work Doctor?" and explains why the answer must always be "No." The suggestions he makes may help you explain to your patients, in terms they can understand, why dental work can never be guaranteed.

★ ★ ★

A most interesting article by Alfred W. Chandler, Rear Admiral (DC) USN, describes "Naval Dental Personnel Under Fire in Korea." Two pages of pictures illustrate the story—give readers a close-up of the work of their Dental Corps colleagues.

★ ★ ★

After reading Doctor C. B. Warner's article, "Those Secret Messages," we were tempted to refer to it as "DWAZI ZIGLID NIZZOCIZ," following the author's advice to try cryptograms and see how absorbing a hobby it can become. Many amateur code sleuths served our country well during the past war, and one particularly skillful and patient hobbyist has the distinction of having broken a so-called "unbreakable" code that had stumped experts for fifty years.

★ ★ ★

Of course you'll find all of the regular departments and features you look for every month!

is evidence that the nasociliary nerve and the sphenopalatine system represent in the human being the remnants of this frontal nerve and conform to the deep ophthalmic nerve of lower animals.

Deep Ophthalmic Nerve—Easily detectable in lower animals, the deep ophthalmic nerve has been identified in human embryos as a separate sensory ganglion associated with the third nerve.

It is presumed to be largely submerged in the various branches of the nerves mentioned above which are distributed to the deeper structures in the orbit and nose, while its cutaneous functions have been taken over by an outgrowth of the maxillary division of the original fifth nerve, known in the human being as the ophthalmic nerve of first division.

Archaic System of Nerves—An interesting speculation is that the atypical trigeminal neuralgias might be neuralgias affecting this remnant of a primitive deep ophthalmic nerve. Lying coronal to the fifth nerve this sensory nerve might have its sensory root in the medulla below that of the ophthalmic division. This would bring it into close proximity with the dorsal horn cells in the upper cervical cord. It can be imagined that spread of stimulation from this sensory root would eventually affect the distribution of the upper cervical nerve roots; namely, the occipital region of the head, neck, and upper arm.

No Proof of Theory—The pathologic etiology of true trigeminal neuralgia is still unknown. If histologic evidence of pathology in this condition within the trigeminal nerve could be found, it might be expected that similar evidence of pathology in this archaic system of nerves would also be found. Such evidence, however, is still totally lacking.

Results of Treatment

1. If the theory discussed were authentic it would be expected that section of the peripheral nerves or of the posterior roots to cut off such stimuli from the central nervous system would effectively stop the pain.

(*Continued on page* 240)

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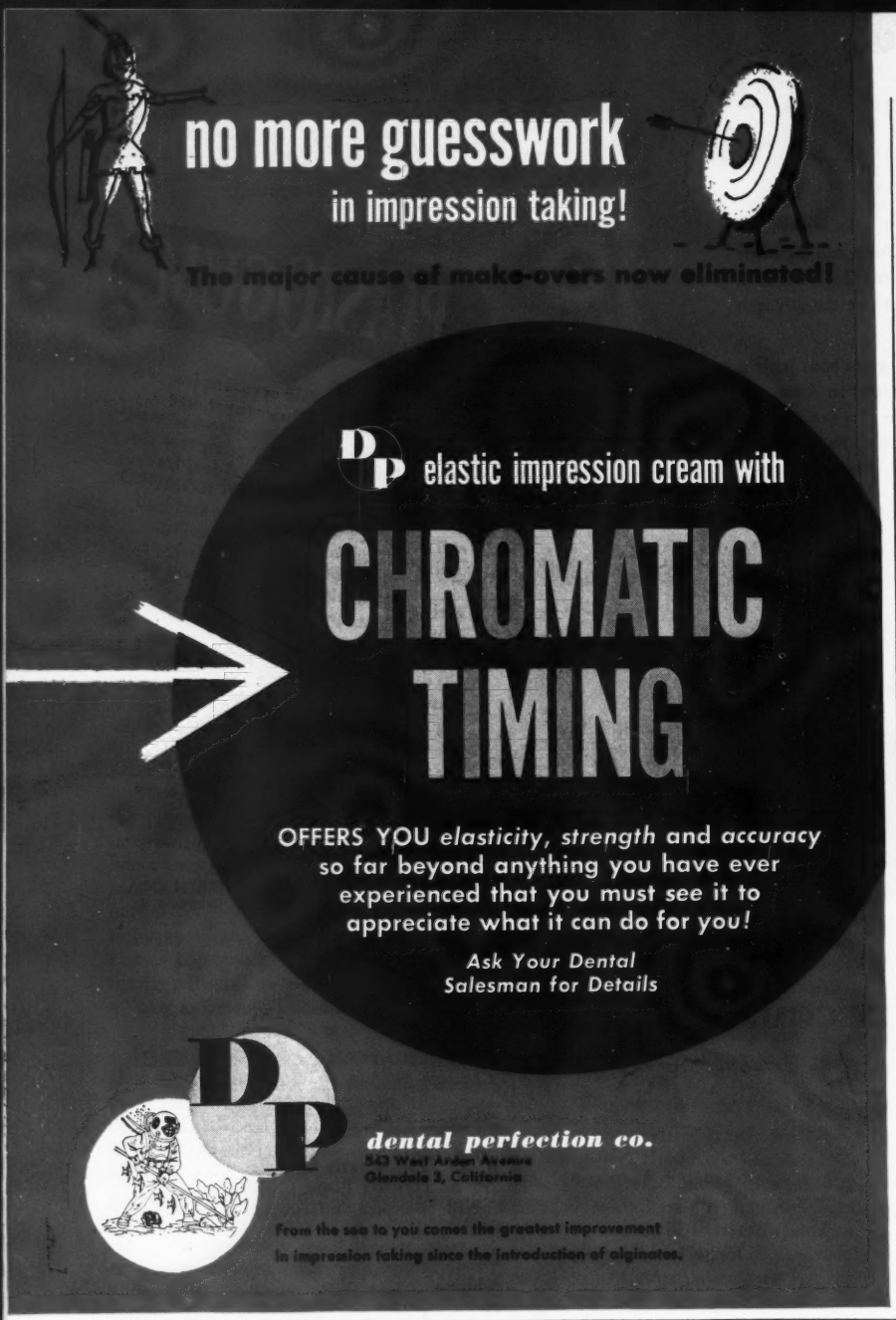
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(*Continued from page* 236)

This is so in a small proportion of cases.

2. Section of peripheral branches is almost uniformly unsuccessful and section of the trigeminal posterior root has some success only in the group of cases without etiology and is of no value in the post-traumatic and herpetic variety.

3.Section of pain fibers within the medulla has similar results.

4. The results of division of the quintothalamic tracts are not yet available; operations on this tract are of recent origin and have only been carried out in a few instances.

5. The only other surgical treatment available is the alteration of the patient's attitude to his pain by means of a prefrontal lobotomy. While having no effect on pain as such, this operation may make life tolerable for the patient by rendering him indifferent to his pain. The results are short-lived, lasting a few months or a year at the most, and in themselves suggest that the psychologic element in these cases is not a large one.

Conclusion

Time relationship has considerable significance in treating the postherpetic and post-traumatic cases; there is little doubt that operations on sensory roots early in the course of the illness are far more effective than those completed at a later stage.

It seems probable that even if the theory advanced in this article were verifiable, sooner or later there results within the central nervous system itself some additional change which renders operations upon peripheral nerves and roots ineffective.

Adapted from *British Dental Journal* **89**:243-247 (December 5) 1950.

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